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THE IRON AGE

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December 9, 1937

ESTABLISHED 1855 Vol. 140, No. 24

Why Favor a Friend to Nobody?

THE Corporate Surplus Tax Act is a friend to no one. Listen as you will, there's not a single voice raised in its defense. It is admittedly a chief cause of today's serious slump and therefore primarily responsible for the drastic shortening of working hours and thinning of wage envelopes all over this country. Why, then, not repeal it immediately?

Congress would like to do just that. But the Administration says "We cannot afford to lose the money and we cannot get a modified or a substitute tax act during this session."

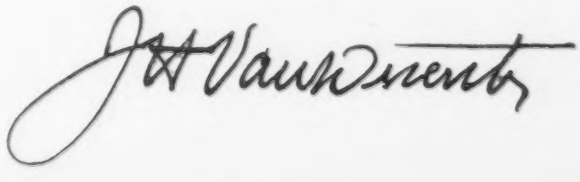
What would the Government lose if it repealed this Act now, making repeal retroactive to Jan. 1, 1937, thus immediately releasing the brakes on business? It would lose $60,000,000. But how much more than this will it lose in diminished profit taxes and smaller personal income taxes, if the depression is not checked? And what awful multiples of this comparatively small sum will it have to spend in relief and in public works if hundreds of thousands of workers continue to be laid off or put on short time?

You may ask what has this Corporate Surplus Tax Act to do with laying men off? Why cannot employers carry them by making stock as they used to do in the horse and buggy days? The answer is that the Act imposes a heavy **fine** upon employers in the form of future taxes if employment is not cut sharply as orders dwindle off.

Early in the depression, before the brain trust boys had thought up this clever Act, employers did carry labor. Corporations dug into their surpluses for that purpose to the tune of $17,000,000,000 during that period. Uncle Sam's records will show this to be true. Today corporations dare not touch surpluses because they face a heavy penalty under the operation of this Act.

The reason for this is that the Corporate Surplus Tax Act does not tax a surplus as such, but taxes any increase in it during a given year. Thus if a corporation decreases this surplus by making stock or otherwise carrying labor, it is penalized by that amount during the following year. It is not allowed credit for such loss of surplus no matter how estimable the purpose. Taxes the following year will begin on the reduced surplus, not on the original one.

There seems to be a joker in this Act, and the most brutal part of the joke is on labor. But it is nothing to laugh at. You can help get this joker discarded by urging your Congressmen to repeal the Corporate Surplus Tax Act now at this session.



Connecting

By W. M. McCALL

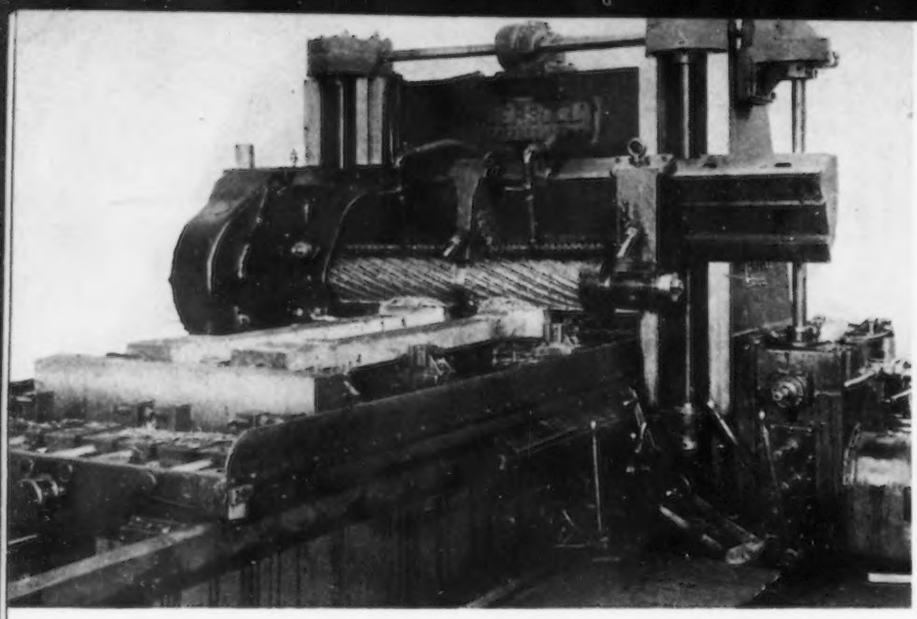


FIG. 1—Slabbing two locomotive main rods on an Ingersoll horizontal milling machine.

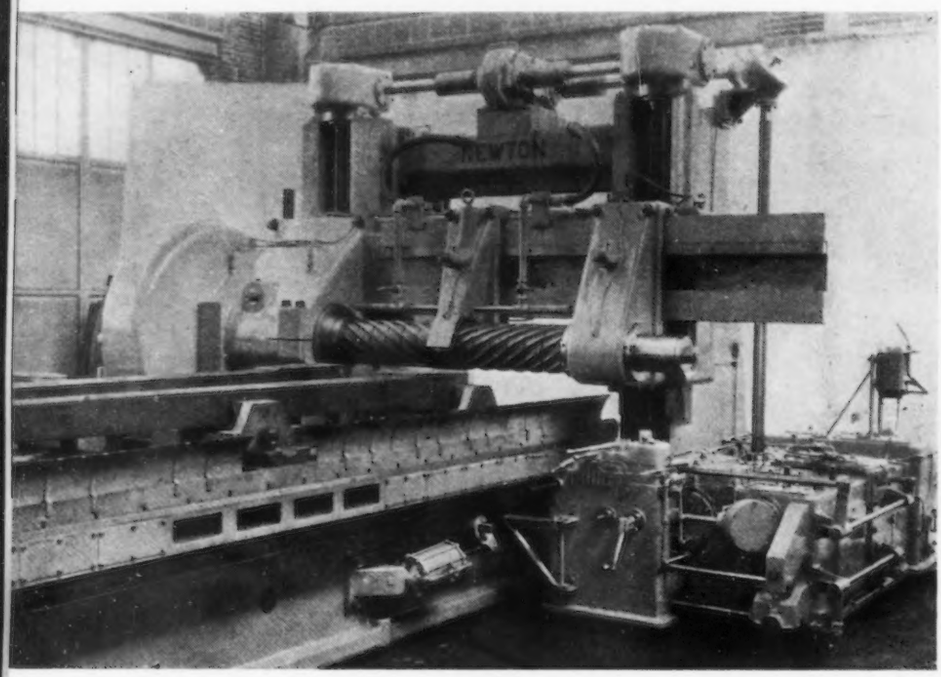


FIG. 2—Two main rods ready to be slabbed on a Newton horizontal milling machine.

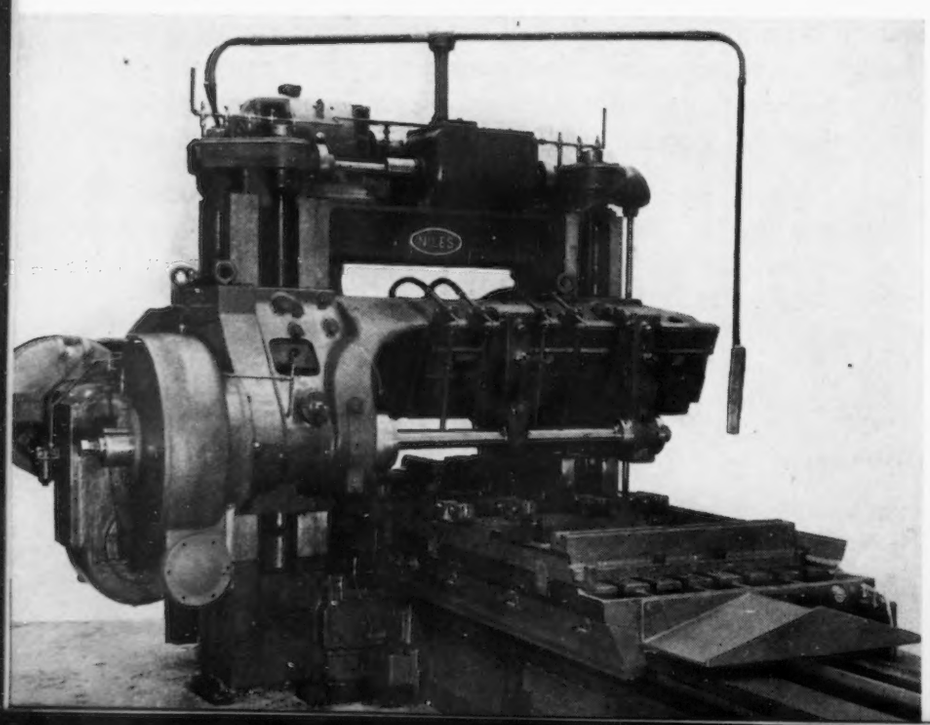


FIG. 3—Niles horizontal rod milling machine showing universal rod fixtures. Fixtures are suitable for different sized rods and also for holding rods during different operations.

HEAVY duty machine tool equipment is necessary for the major machining operations on locomotive main and side rods as considerable metal must be removed to finish the rods from the rough forgings. These operations are commonly known as slabbing, channeling, edging and contouring. Slabbing is the operation of machining the side surfaces of the rod. Channeling is removing the metal on the sides between the ends to give the rods an I beam section. Edging is machining the edges of the rods, and contouring is the machining of the edges at each end to the required contour. Boring is also a heavy operation when the rod ends are forged solid, necessitating the use of trepanning cutters to remove the metal from the center of the bore.

The slabbing operation is usually performed entirely on machines known as horizontal rod milling machines, although in some cases special planers are used to plane the sides of the butt ends of the rod after the portion between the ends has been slabbed on a horizontal rod milling machine. Figs. 1 and 2, respectively, show Ingersoll and Newton horizontal rod milling machines slabbing a pair of rods. Fig. 3 shows a Niles machine of similar design. Edging

Rods Are Machined With Heavy Duty Equipment

operations performed on Newton and Ingersoll horizontal machines are illustrated in Figs. 4 and 5, respectively. Fig. 6 shows the channeling cutters and two rods which have been channeled on the table of an Ingersoll horizontal machine. Fig. 7 illustrates the contouring operation on the end of a rod on an Ingersoll horizontal machine.

The largest machines of this type have tables wide enough to accommodate two main rods with the butt ends 24 in. wide and still permit the use of a center support on the cutter arbor between the two slabbing cutters. The spindle of these machines is usually driven by a 75 hp. motor either A.C. or D.C. The spindle saddle is integral with the crossrail which keeps the spindle in alinement with the face of the crossrail. The Ingersoll and Niles machines have crossrails with inclined faces, the theory being to absorb the thrust of heavy cuts. The outboard and center bearings for the arbor are individually adjustable along the face of the crossrail. The center bearing support is of the split type, permitting removal of the arbor without removing the support.

The work table is provided with power feed and rapid traverse in each direction, and the crossrail is provided with vertical feed and

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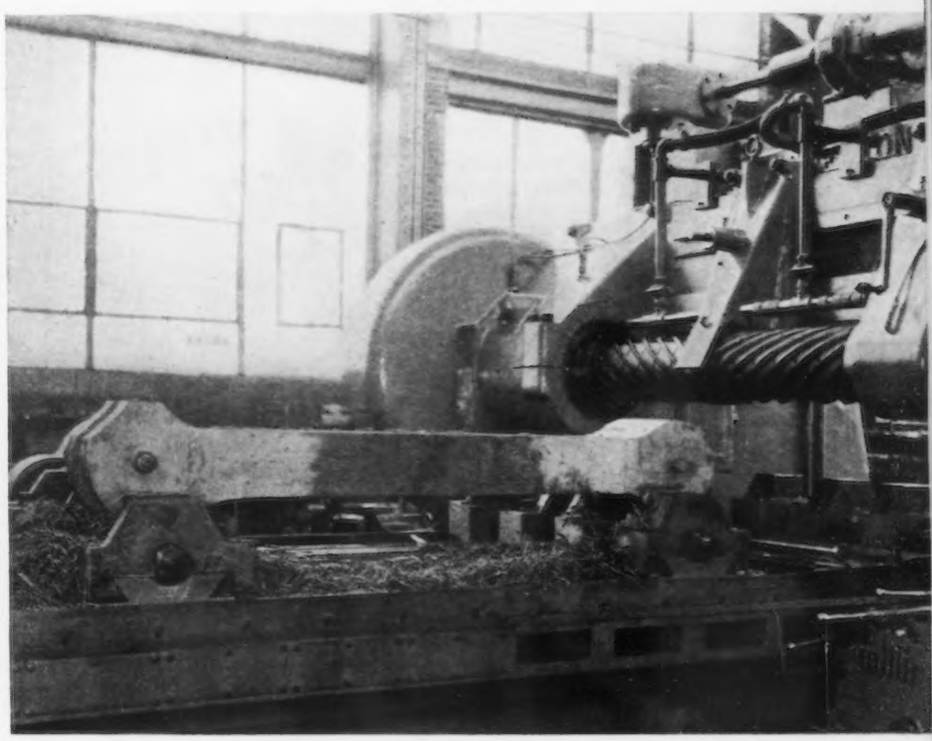

FIG. 4—Side rods set up on Newton horizontal milling machine for edging operation.

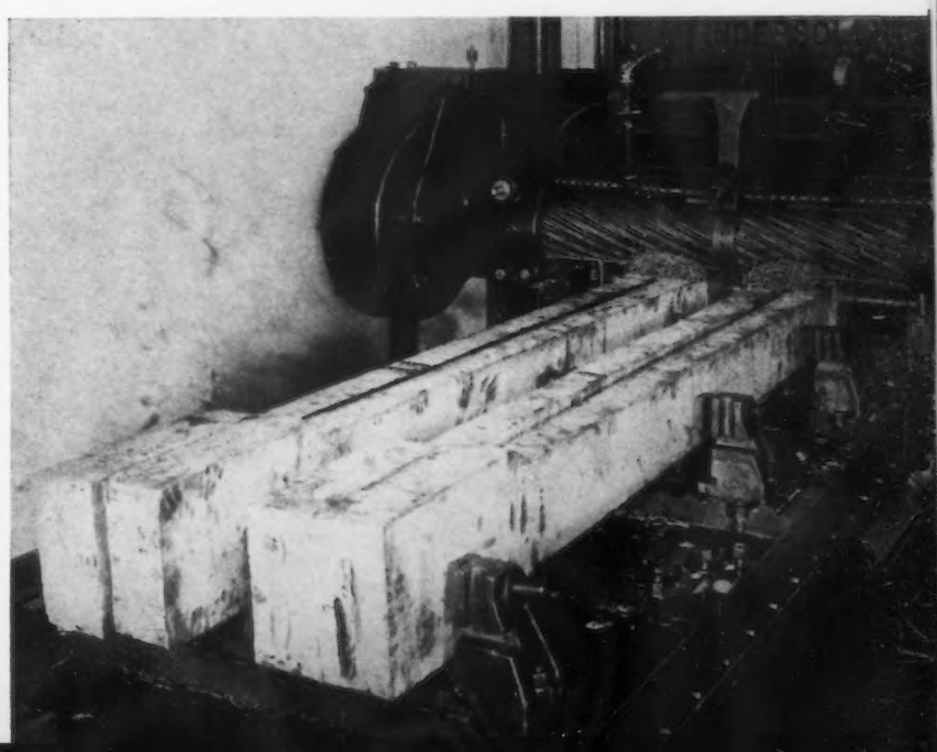

FIG. 5—Edging four main rods on an Ingersoll horizontal milling machine.

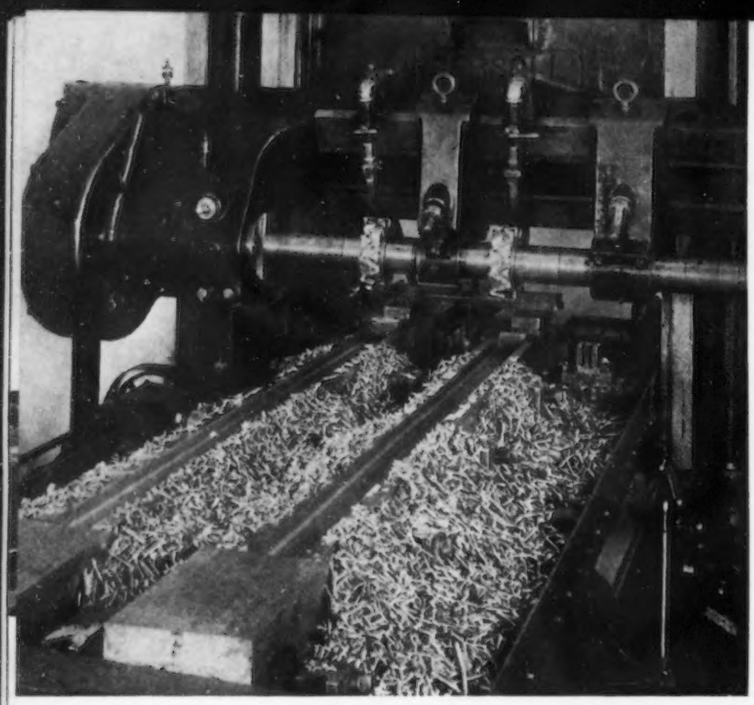

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FIG. 6—Two main rods on Ingersoll horizontal milling machine which have had one channeling cut. The cutters used are patented Ingersoll inserted tooth channeling cutters which throw the chips alternately to either side. The cutter housing is so milled that there is ample backing for each tooth and yet sufficient chip clearance to prevent clogging during fast feeds.

o o o

while watching the cut, enabling him to use a combination of table and crossrail feeds and follow the contour on the end of a rod as shown in Fig. 7. The punch marks on the rod end in this illustration show how accurately the operator can follow a contour.

Universal type of fixtures have been developed for these horizontal machines which are suitable for different sizes of rods. They are also suitable to clamp the rods for the different operations performed on the machine.

Smaller machines of this type are available which will slab two smaller rods at the same time or one single large rod.

rapid traverse in each direction. The table feed and vertical feed to the crossrail are independently controlled so the long radii on the side of the rods can be accurately milled by alternately or simultaneously feeding the table forward and the crossrail down. The table can be quickly and positively locked from the operator's position while feeding the crossrail down to sink channeling cutters into the work. This clamping operation is automatic on the Ingersoll machine. The screws which raise and lower the crossrail have thrust bearings at their lower ends to prevent their buckling when sinking channeling cutters into the rods. The control levers for the machine are grouped near the front of the right hand housing so that the operator has complete control of the machine

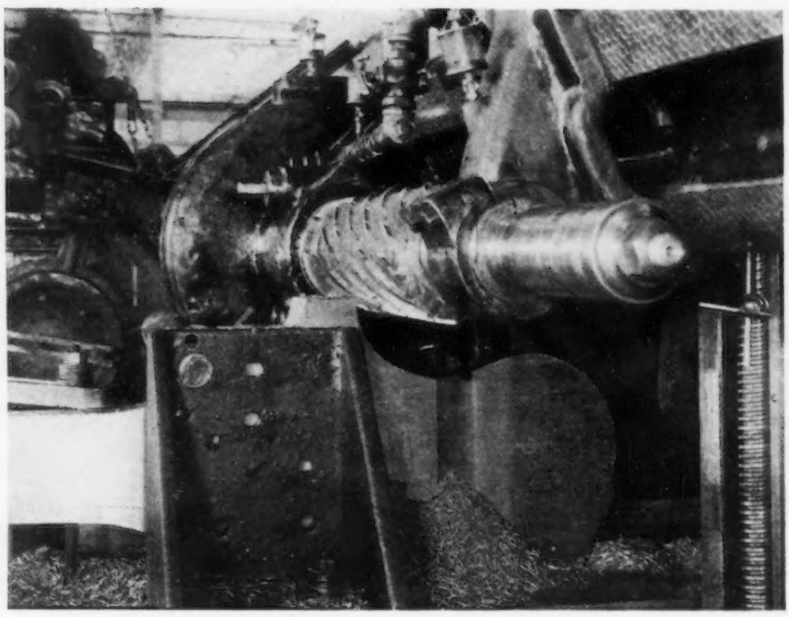


FIG. 7—Milling the contour on a rod end on an Ingersoll horizontal milling machine. The punch marks on this rod end clearly show how accurately the operator can follow a contour.

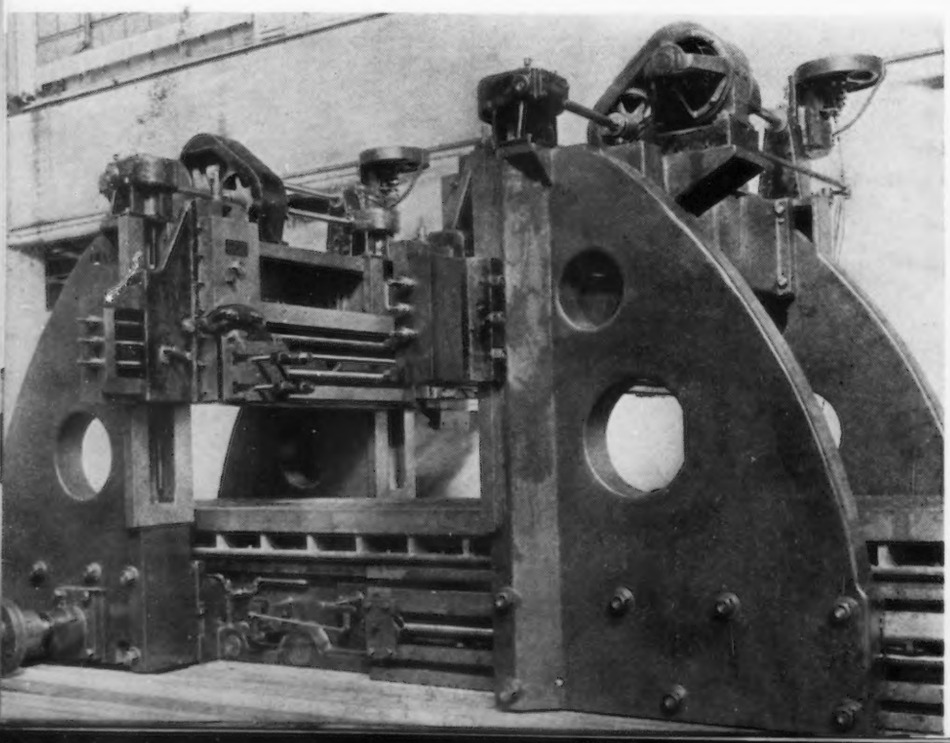


Fig. 8 shows a Betts double planer suitable for planing the sides of the butt ends of two rods. The machine is provided with two sets of housings, one set being fixed and the other set adjustable along the bed by power to suit the length of the rods. The crossrails are arranged to face each other

o o o

FIG. 8—Betts double planer for planing the sides of the butt ends of two rods. The housings to the right are adjustable by power along the bed to suit the length of the rods.

and each crossrail is provided with two heads. The butt ends of two rods on the table are planed by the two heads on one crossrail as the table moves in one direction. When the table reverses, the other ends of the two rods are planed by the two heads on the other crossrail. Both strokes of the table are therefore cutting strokes.

Operations on the ends of rods are performed on vertical milling machines. These operations include rod ending, milling out jaws and tongues, trepanning, boring and contour milling. Fig. 9 shows a Newton vertical milling machine milling the contour on the end of two rods. The housing which holds the spindle moves transversely across the base while the table saddle moves on the base perpendicular to the direction of the housing movement. The table has circular movement on the saddle. Fig. 10 shows an Ingersoll vertical milling machine performing a similar operation. On this machine the housing and table saddle move at right angles to the direction of the corresponding units on the Newton machine. Feed or power traverse in either direction is provided for all three movements. The combination of the three movements, independently controlled, makes it possible to mill any contours necessary in finishing locomotive rods. The rods are held on the table in special fixtures as shown in position in the illustrations and also on the floor in Fig. 9. A jib crane on the machine supports the overhanging ends of the rods. All control levers are at the operator's station close to the work. The operator can clearly see the cut, and can accurately follow any layout marks without moving from his position at the levers. The cutters shown in Figs. 9 and 10 are supported at the bottom by arbor supports bolted and doweled to the housing.

Fig. 11 shows an extra heavy Niles vertical milling machine. The base and the spindle housing are bolted together on this machine. A carriage moves longitudinally on the base while the table rotates on its saddle which moves transversely on the carriage.

The spindle quill on all three of these machines may be provided with power vertical feed. When the machine is so equipped, drilling, boring and trepanning operations may be performed on closed end rods. Rectangular holes are milled in closed end rods by first drilling a hole and then inserting the milling cutter through the drilled hole for the milling operation. Some rods are now forged with rough holes in their ends, requiring only boring or milling operations for finishing. When milling with these machines, the spindle quill may be rigidly locked at any point within its range to support the spindle.

Fig. 12 shows an Ingersoll vertical machine milling the tongue on a rod. Jaws on the rod ends are milled out in a similar manner. Blocks of metal are removed from rods which are to have open ends by milling slots along the three sides of the required opening.

Figs. 13 and 14, respectively, show Ingersoll and Newton vertical milling machines which are suitable for operations on valve motion rods, smaller than the main and side rods. These machines are also used for general purpose profile milling.

Although the rod ends may be bored on vertical milling machines having power vertical feed to the spindle, it is more advantageous to bore them on a double spindle

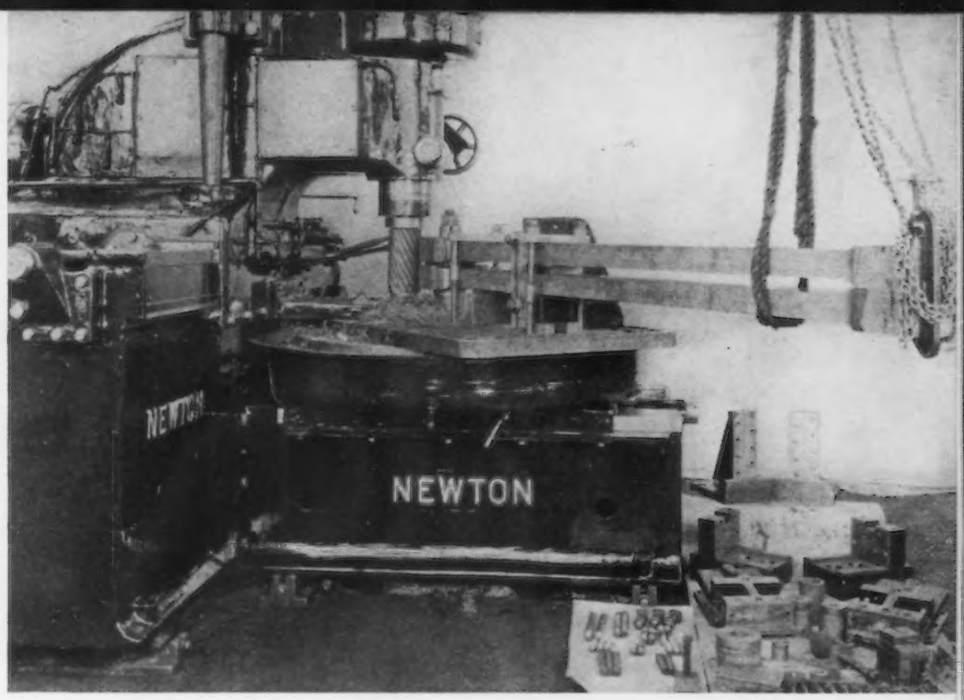
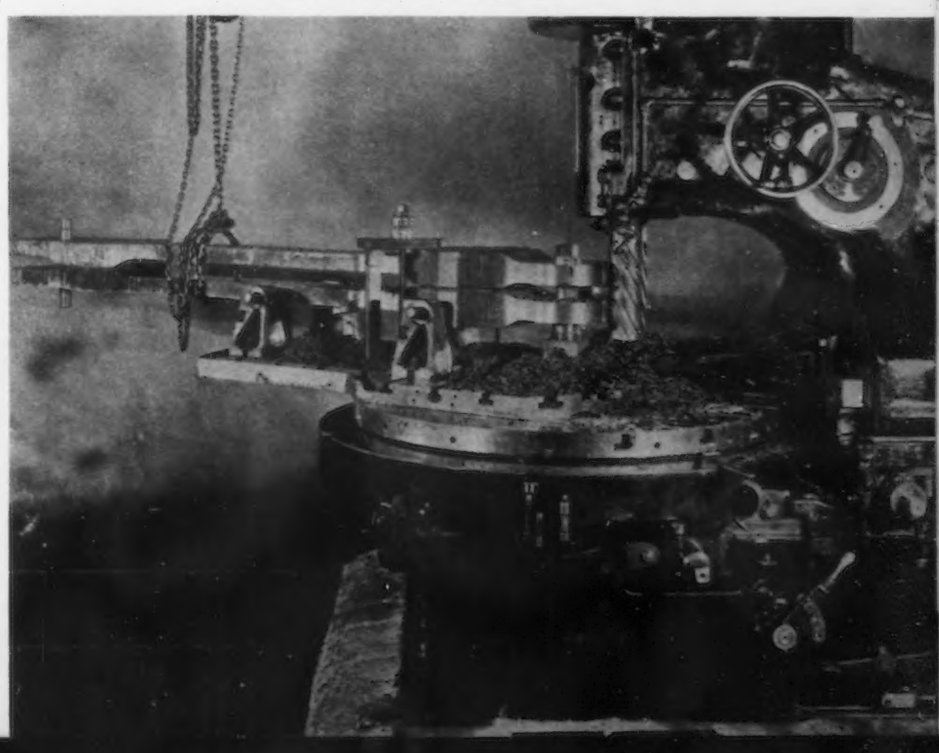


FIG. 9—Newton vertical milling machine milling the contour on the end of two rods. Various fixtures for rod work are grouped on the floor.

FIG. 10—Ingersoll vertical milling machine milling the contour on the end of two rods. The overhanging portion of the rods is supported by a jib crane mounted on the machine.



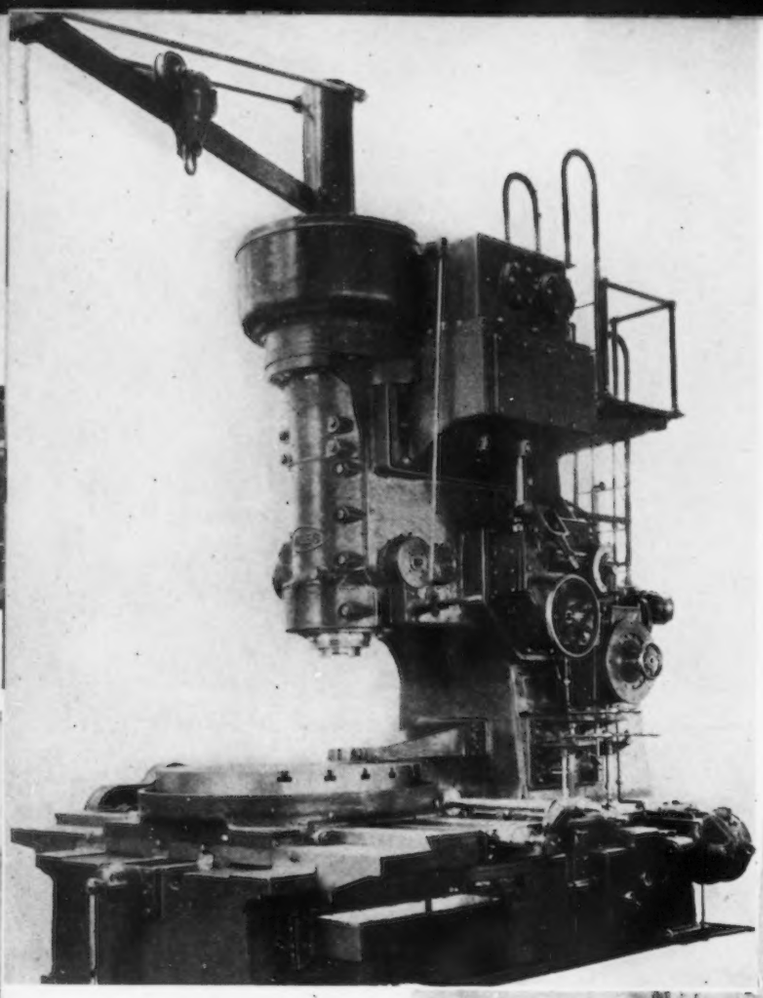


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FIG. 11 — Heavy duty Niles vertical milling machine. Machine is suitable for heavy trepanning operations.

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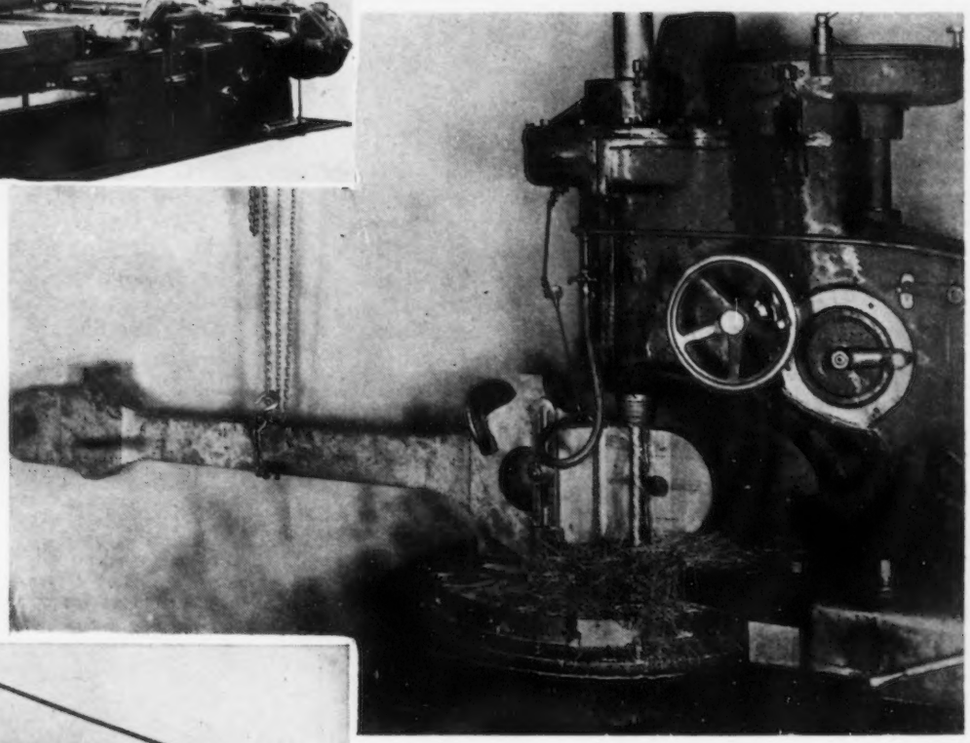

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FIG. 12 — Milling the tongue on a rod on an Ingersoll vertical milling machine. An Ingersoll solid helical cutter is used, supported at the bottom by the lower arbor support, which is bolted to the housing. The overhanging portion of the rod is supported by the jib crane.

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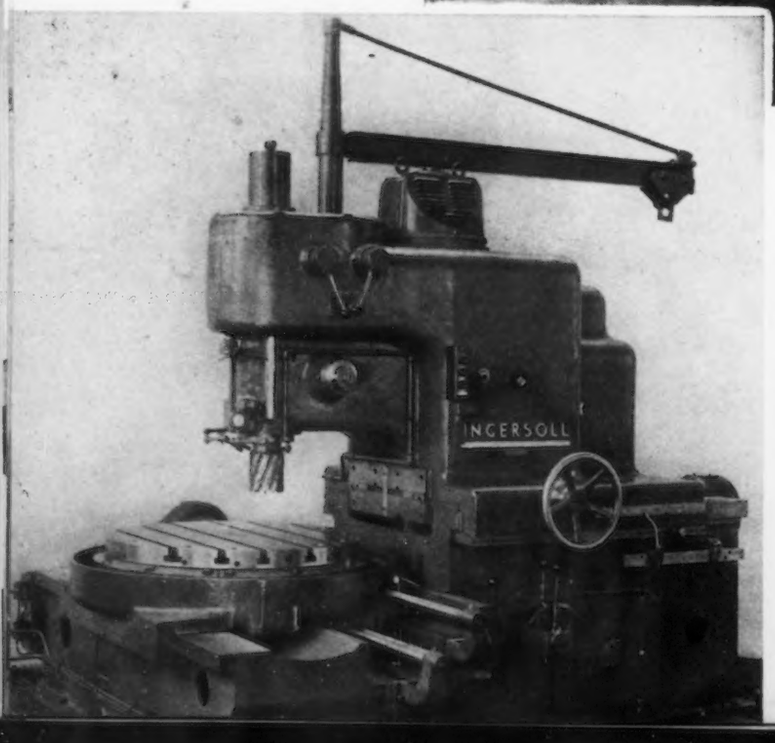

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FIG. 13 — Inge-soll vertical milling machine suitable for contour operations on valve motion rods.

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boring machine which insures accurate duplication of the center distances on like rods. A machine of this type is illustrated in Fig. 15 which shows a Newton duplex locomotive rod boring machine. Each spindle may be used independently as separate motors drive them. Each spindle has independent power feed and quick return. Also, fine hand feed is provided. The lower spindle support greatly increases the accuracy when boring with heavy feeds.

When equipped with the adjustable drop table, shown in the illustration at the left hand end of the regular table, the machine is adapted to the boring and reaming of the taper holes in cross heads.

Fig. 16 illustrates a special Niles rod boring machine for rapid boring and facing of connecting rods. Two independent boring units are adjustable along the bed to suit the center distance of the rods. The spindle is driven for the slower speeds by a motor at the rear of the unit through the V-belt drive protected by the guard in the foreground. The higher spindle speeds are obtained from the less powerful vertical motor on top of the unit. When the higher speeds are used, it is not necessary to disconnect the drive for the slower speeds

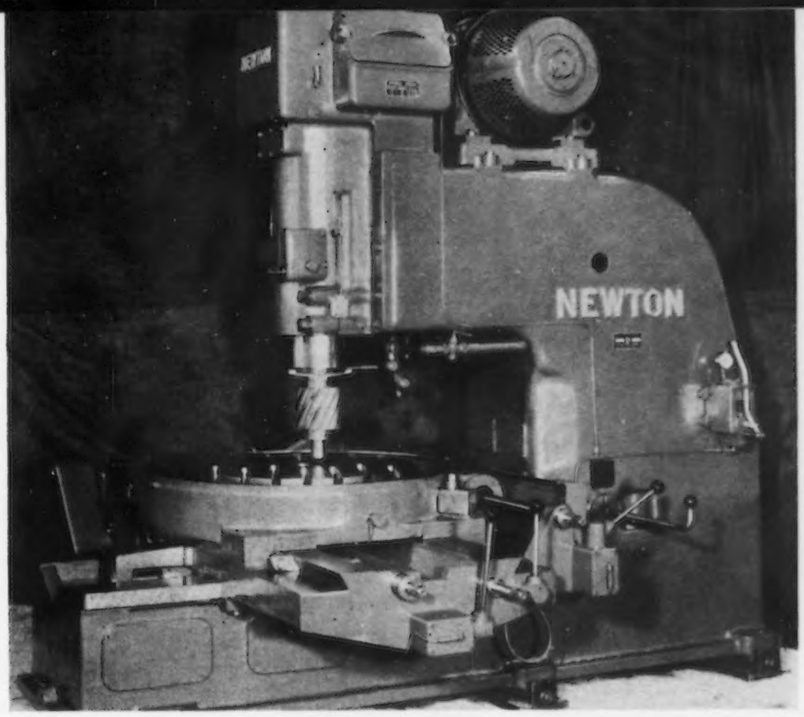

FIG. 14—Newton vertical milling machine suitable for contour operations on valve motion rods.

of revolutions of the vertical shaft must be made larger or smaller than the number of revolutions of the spindle to impart radial movement to the tool holder. This is accomplished by an ingenious application of differential bevel gearing commonly known as the "jack-in-the-box" mechanism, which is located at the upper end of the vertical shaft where it extends above the hollow spindle. The center portion of the differential mechanism is keyed to a worm-wheel in mesh with a worm which locks it and prevents its rotation.

The extension of the vertical shaft above the differential mechanism is rotated by gearing from the spindle at exactly the same speed as the spindle but in the reverse direction. The vertical shaft itself is therefore rotated through

as the higher speeds free-wheel over the slower speeds through a free-wheeling clutch built in the mechanism.

Each boring unit consists of the column which is mounted on the bed, and the spindle head which is vertically adjustable on the front face of the column. Boring feeds are obtained by feeding the spindle head on the column. A Vickers hydraulic feed system is used for the feed and traverse of the spindle head.

Ways are machined in the end of the spindle in which the tool holder is radially adjustable from a stop which locates it in the center for boring, to its maximum radial position for facing and counterboring. A horizontal screw and nut adjust the tool holder along the ways in the end of the spindle. This screw is rotated by bevel gears from a vertical shaft extending upward through the hollow spindle, whose center line is coincident with the center line of the spindle. It is obvious that this vertical shaft must make exactly the same number of revolutions as the spindle to keep the tool holder from moving radially in the end of the spindle. It is also obvious that the number

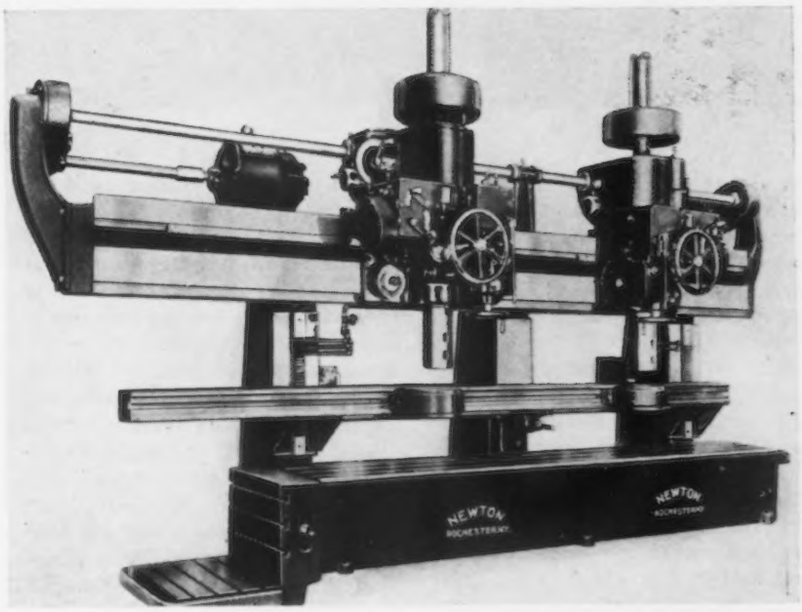

FIG. 15—Newton duplex locomotive rod boring machine. Machine illustrated is equipped with adjustable drop table for boring and reaming taper holes in cross heads.

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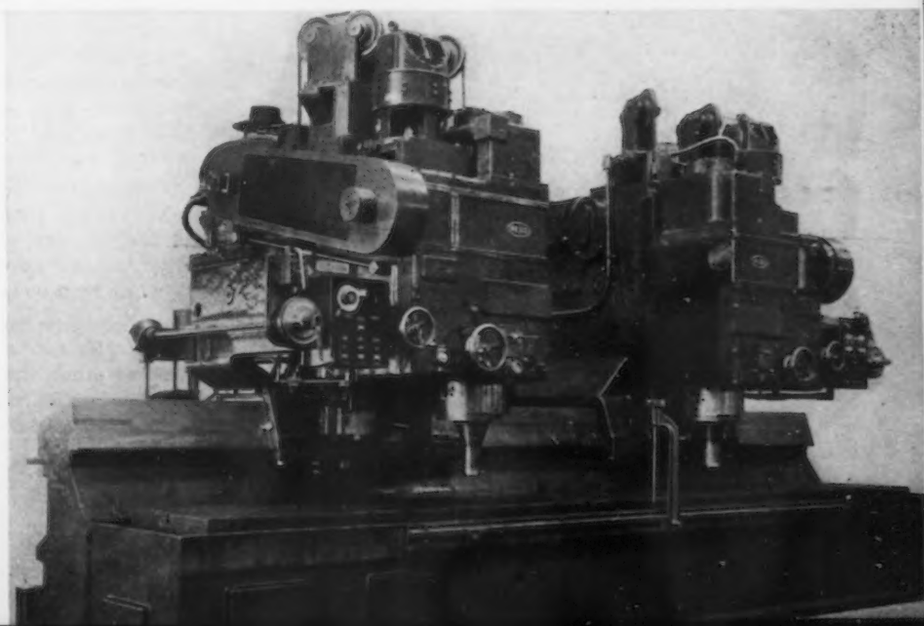
FIG. 16—Special Niles rod boring machine with hydraulic boring feed and hand facing feed.



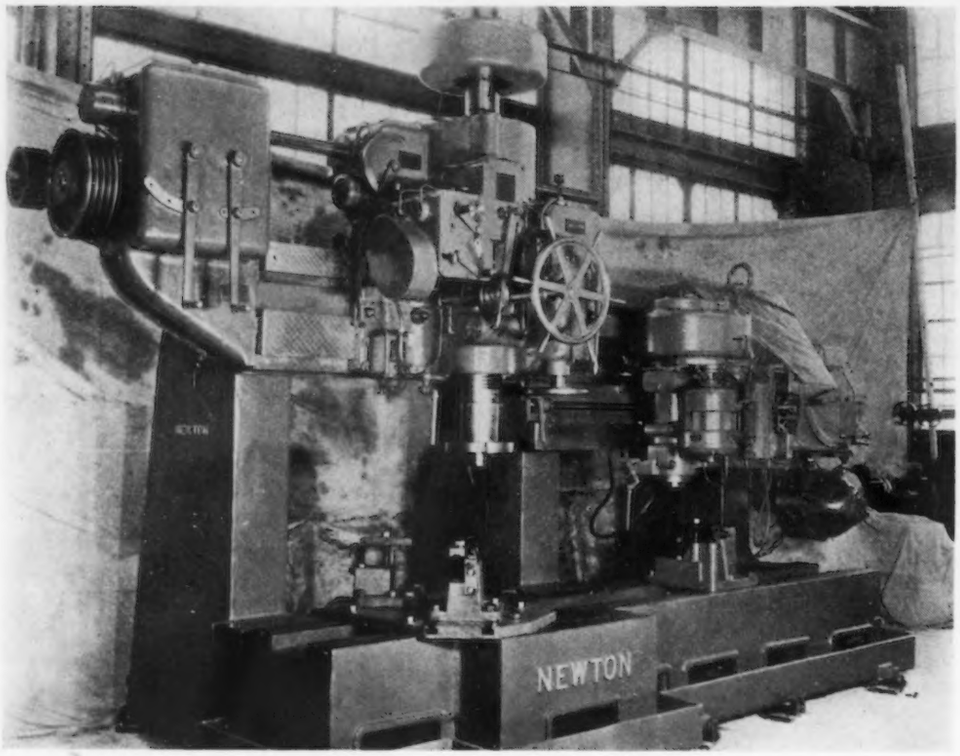


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FIG. 17 — Newton combination rod boring and milling machine. A round hole is bored in one end of the rod while a rectangular hole is milled in the other.

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the differential mechanism at the same speed as the spindle and in the same direction. The worm in mesh with the wormwheel on the center portion of the differential mechanism is rotated by the handwheel on the front of the spindle head. When this handwheel is turned, the center portion of the differential mechanism is rotated, causing the vertical shaft to turn slower or faster (according to the direction the handwheel is moved) than the spindle and provide the required radial movement of the tool holder.

Fig. 17 shows a Newton combination boring and milling machine for boring a round hole in one end of a rod and milling a rectangular hole in the other end. The machine is illustrative of combining sections of standard machines to provide a specialized machine tool. For the left hand unit this machine utilizes the boring head of the standard duplex rod boring machine illustrated in Fig. 15. A standard unit drive milling head is used for the right hand unit. This unit head is fed or traversed along the face of a secondary crossrail in a direction perpendicular to the face of the main crossrail. The secondary rail is on a knee bracket which is fed or traversed along the face of the main crossrail. The combination of these movements makes it possible to mill out rectangular openings with corners equal to the cutter radius. Each unit may be operated as an individual unit due to the fact that each is provided with separate motor drive.

Most railroads manufacture their own rods, and therefore do not have to keep a large stock of various sized rods which are necessitated by the many different classes and types of locomotives in service.

Machinery Exports Highest Since 1929

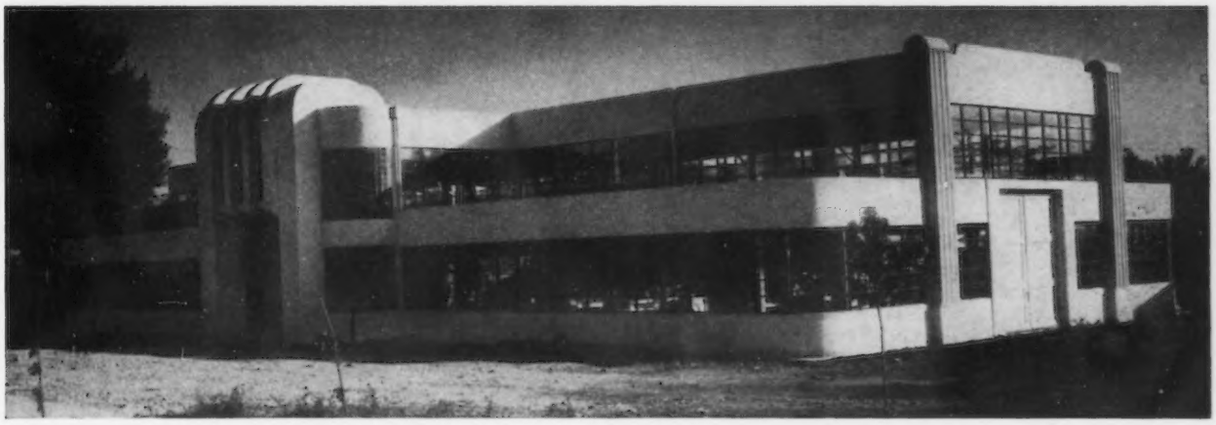
WASHINGTON, Dec. 7. — Exports of industrial machinery from the United States during October were valued at $24,438,596, the highest monthly value recorded for any month since July, 1929, according to the Machinery Division of the Department of Commerce.

Foreign sales of industrial machinery for the first 10 months of this year were valued at $206,801,869, an increase of 47 per cent over the corresponding period of last year when exports aggregated $140,487,116.

All of the major groups shared in this advance, ranging from 20 per cent in other metalworking machinery to 83 per cent in power-generating machinery.

Exports of farm implements and machinery from the United States in October were valued at $6,826,322, an increase of 61 per cent over the corresponding shipments in October, 1936, valued at $4,252,838, according to the Machinery Division, Department of Commerce.

While there was a slight seasonal decline as compared with the foreign sales during September of this year, the division reports that the total sales for the first 10 months of this year, aggregating $64,114,356, show an increase of 73 per cent over the $37,095,402 exported during the corresponding period in 1936.



Modernistic Factory for a Modern Product

FOR the prefabrication of welded steel houses, the Hobart Brothers Co., Troy, Ohio, has recently completed an arc welded steel factory of modernistic design. The newest ideas for the comfort of workers have been embodied in the new building. For example, it is completely insulated through the use of welded steel panels consisting of two sheets spread apart by a steel strut. The insulation is packed in these panels and the whole assembled into the frame by the use of arc welding. Insulated side panels are 4 in. thick and on the roof 8 in. thick, thereby insuring minimum heating cost in winter and maximum comfort to workers in summer.

Insulation used in the walls and roof is the equivalent of a 30-in. brick wall insofar as heat passage is concerned. As insulation of dwellings is now an accepted principle of modern construction, Hobart Brothers Co. adapted the idea to factory construction, with results which, it is believed, may bring a new trend in manufacturing plants.

The building consists of a large center bay 40 ft. wide by 25 ft. high, flanked on each side by lower sections 20 ft. wide and 12 ft. high. The entire building is made integral by arc welding. Two-thirds of all vertical surfaces are clear glass brick, insuring best daylight conditions.

All parts for the structure were fabricated from the formed steel in the company's steel house shop and erected by the same workers. All trusses, panels, windows and small parts were welded into subassemblies and passed on to welding crews who welded them into their final positions, exactly as a steel house is now prefabricated in the finished factory.

Each window is 3 x 7 ft. with five horizontal glasses in each, and each one was made to abut adjacent window without mullions between, giving the effect of continuous glass sections all around the building. Corners were made round with curved glass continuous, giving a very pleasing and modernistic exterior effect. One-third of the windows are hinged on the side and the opening controlled by an opening and closing device to set the window at any desired point. As the windows are very large and open laterally rather than vertically, they can be set to serve as air scoops and force air through the building on warm days. To take advantage of prevailing breezes from any direction, alternate windows were hinged on opposite sides.

Specifications required overhead traveling hoists to lift heavy sec-

(CONTINUED ON PAGE 135)

Another Portfolio of Unusual

Collected by Francis Juraschek

Consulting Editor, The IRON AGE

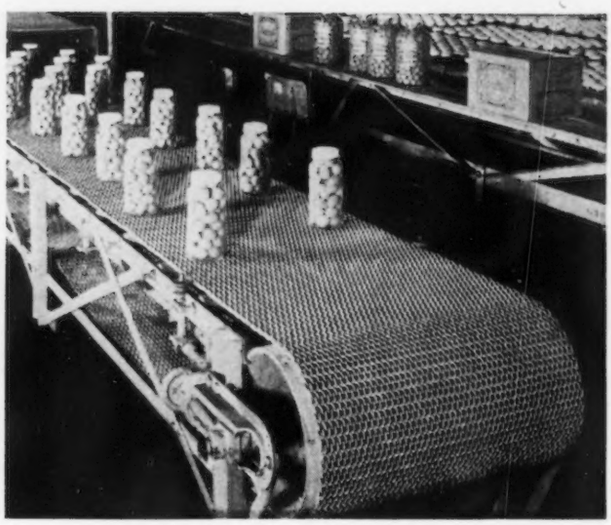


FIG. 1—Wickwire-Spencer woven wire metal conveyor belt for medium temperature use.

THERE are, in general, two essential questions which face the prospective user of mechanical materials handling equipment: first, the economy of mechanical handling in general; and second, the selection of suitable equipment and the application of that equipment to specific problems.

There is no doubt today that the economic value of mechanical handling as a factor in production is well understood. The principles have been proved beyond any reasonable doubt, and the methods have become largely standardized. Whether or not specific equipment will prove to be an asset in individual cases, however, must be determined with careful study by the intending user. Often this is only an arithmetical computation, in which present costs are set up in one column, and estimated costs under the proposed new method are set up in a parallel column. Such a comparison will speak louder than volumes of sales argument.

Sometimes, however, it is not a simple matter to make this economic comparison, for other factors, ordinarily of minor advantage or disadvantage may enter into the problem and, of themselves weigh so heavily as to make the cost comparison a minor matter in the overall balance of safety, or speed, or convenience or improved working conditions.

This is especially true in the case of mechanical equipment designed for specific operations not ordinarily considered as essential processes in the normal flow of production. Some of these operations have been discussed in a recent article entitled "Putting Industrial Trucks Through Unusual Paces." A few other similar conditions are noted here.

The use of woven wire metal belts for conveyor operations where moderately high temperatures are encountered is becoming popular in the food-processing industries. In Fig. 1 such a belt is shown, as made by Wickwire-Spencer Steel Co. of a type of metal which is rust-proof, corrosion-proof, and capable of extremely long life under temperature conditions up to 600 deg. F. or higher. The application of belts of this general type in a score of process industries

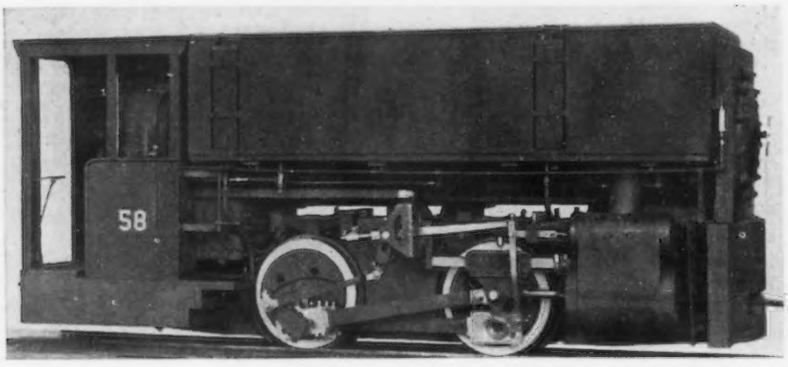


FIG. 2—Porter Co. narrow gage steam locomotive with tractive force of 18,550 lbs.

Handling Ideas . . .

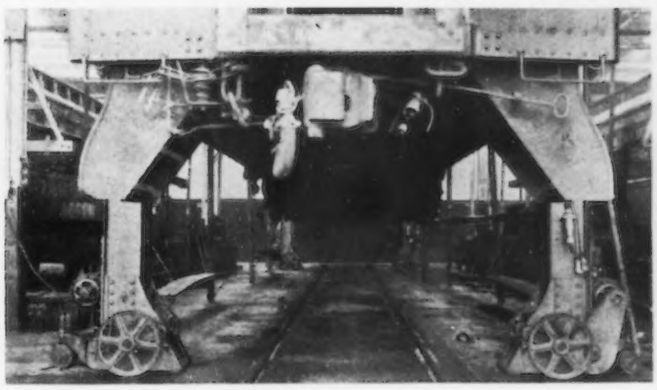


FIG. 3—Whiting Corp. portable car hoists; lifting capacity, 25 tons each.

FIG. 4—Thew-Lorain equipment for picking up and handling large "bites" of pulp logs.

where treatment by heat at less than 1000 deg. F. is required, will repay careful study of the qualities of such equipment.

Considerable attention has been paid of late to the development of industrial locomotives for operation under conditions involving restricted clearances. Fig. 2 shows one of two narrow gage steam locomotives built by the H. K. Porter Co. for use in one of the larger Pittsburgh steel plants. With a total weight of 94,000 lb., a total overall length of 19 ft. 3 in., a width of 68 in., and a height of 93½ in. from top of rails, these locomotives each develop a tractive force of 18,550 lb. They run on 23 in. gage track, and each one is pulling trains on 24-hour service which formerly required two locomotives to handle. The axles are mounted on Timken bearings to reduce frictional losses to a minimum. Although quite costly, the

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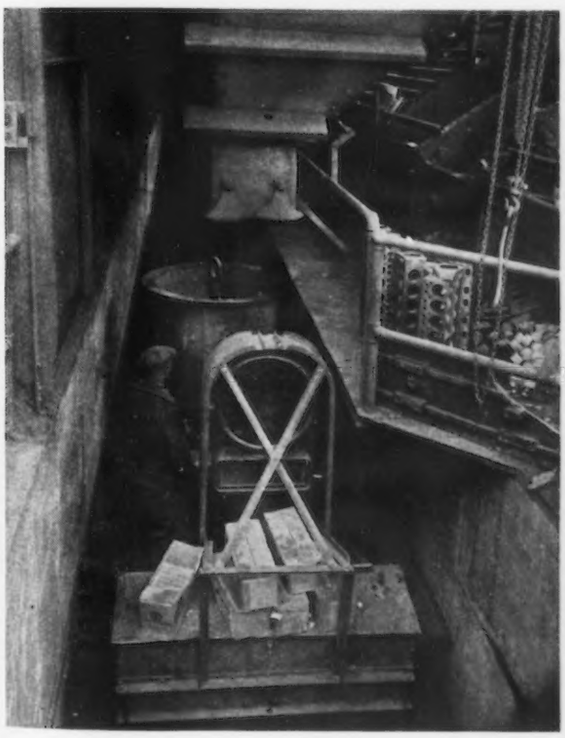
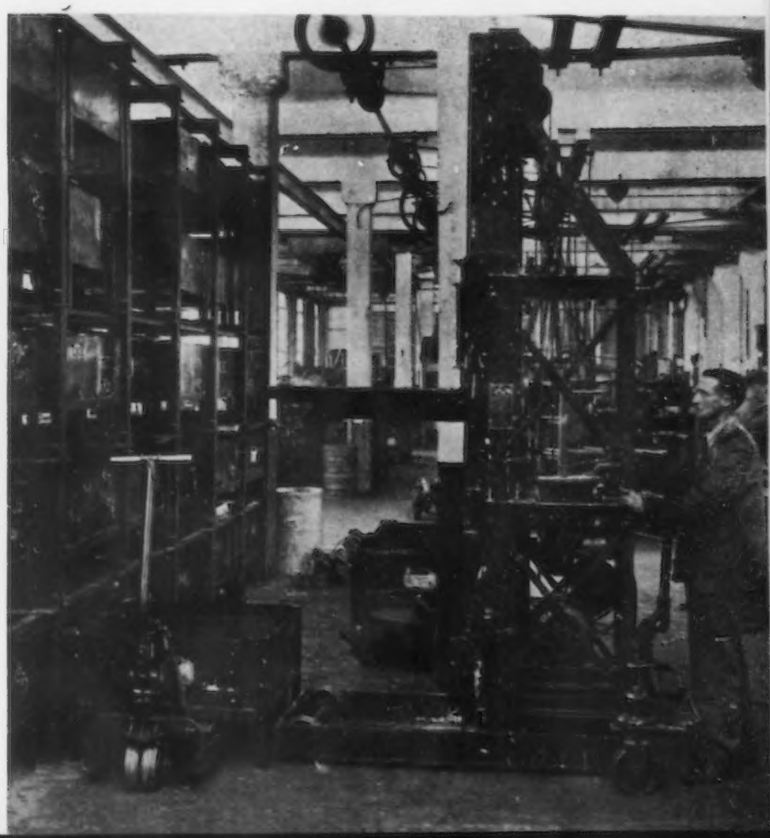
FIG. 5—Whiting Corp. electric scale car equipment in plant of Detroit automobile manufacturer.

BELOW

FIG. 6—Lewis-Shepard "jack-stack-rack" system of storing boxes of parts.





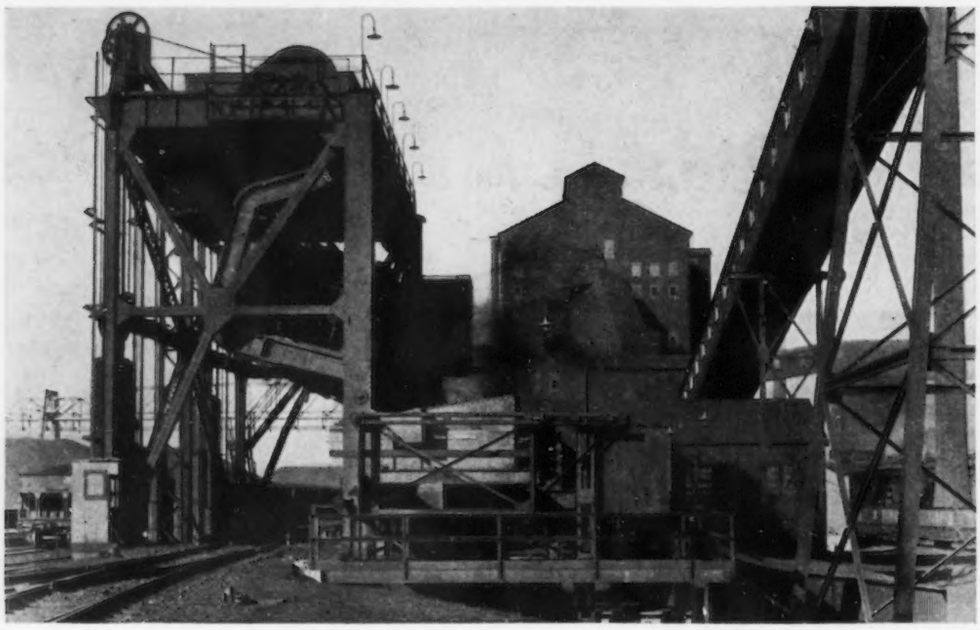


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FIG. 7—Industrial Brownhoist car dumper, for handling railroad cars of coal or ore.

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steel company estimates that they are more than paying for themselves.

While on the subject of railroad equipment it is interesting to note that car repair shops have taken a leaf from the book of garage practice. In the Angus shops of the Canadian Pacific Railway at Montreal, the Whiting Corp. has installed four portable railroad car jacks, each with a lifting capacity of 25 tons. These jacks are shown in service in Fig. 3, lifting a standard Pullman car weighing approximately 100 tons, high enough to permit workmen to get at and repair any part of the under-rigging. When track-pits are not available and emergency repairs are required, these car jacks may be used anywhere that a solid floor is to be had.

A modified orange-peel grab makes short work of handling pulpwood from stock piles in Fig. 4. Rather nasty things to handle at best, the grab, operated from a Thew-Lorain caterpillar-tread "shovel," picks up a dozen or more logs at a bite, with amazing rapidity. Note especially the length of the boom, which permits a very large area to be covered at any one setting of the equipment.

The Whiting Corp. electric scale car illustrated in Fig. 5 is installed at an automotive plant in Detroit. In runs on standard gage tracks through a depressed aisle below a row of hoppers. Materials dumped from the hoppers into the charging bucket on the scale car are weighed on receipt, and thence carried by the car directly to the cupolas.

The Lewis-Shepard "jack-stack-rack" system of parts storage is clearly shown in Fig. 6. Metal

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FIG. 8—Elwell-Parker telescoping boom electric industrial crane truck; 30 ft. reach.

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FIG. 9—Mercury gas tractor, handling automobile bodies on wheeled skids.

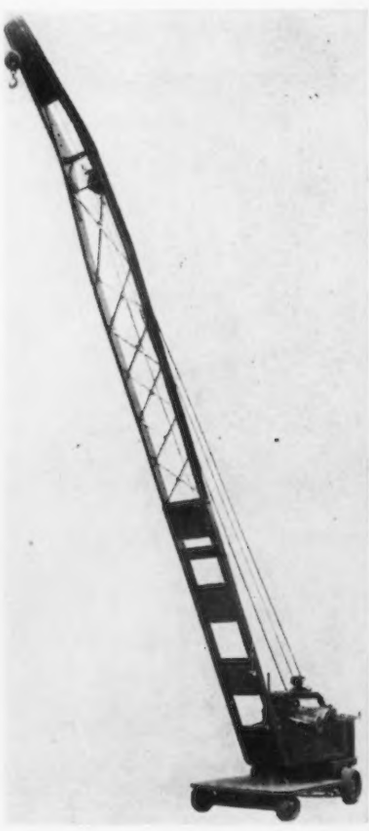

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FIG. 10—Whiting Corp. "wishbone" type cupola charger; two ton capacity.

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FIG. 11—Whiting Corp. depressed type cross-over bridge between two railroad platforms.

parts boxes with four corner-legs are picked up by a jack-lift hand truck and taken to the storage racks. There the jack-lift truck is withdrawn, the stacker platform run under the box, and the box is elevated by the stacker to its place in the storage rack. Notice how simply any box may be taken out of the rack and lowered to the floor to be taken away for refilling.

Steel companies in particular are large users of such car dumpers as is shown in Fig. 7. This illustration is of an Industrial Brownhoist Corp. car dumper picking a standard railroad car full of coal bodily from the track and dumping it at one fell swoop at a steel mill. Similar car dumpers are used to handle cars of ore.

Fig. 8 shows an Elwell-Parker electric industrial crane truck fitted with a telescoping boom which may be run out from a normal of 19 ft. 6 in. to an extreme of 30 ft. The boom is of the motor slew type and will turn through 210 degrees. Both hoist and topping unit are driven by a single motor, equipped with a clutch for throwing the drive to either drum.

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FIG. 12—Whiting Corp. locomotive spotter handling a heavy 2-8-4 locomotive.

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FIG. 13—Cleveland Tramrail electric hoists used as winches to handle heavy oven doors.

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This is a mighty handy piece of equipment for handling light miscellaneous loads around a plant yard.

The Mercury Mfg. Co. light, three-wheel gas-engine powered tractor shown in Fig. 9, moves automobile bodies on wheeled skids around an assembly plant with ease. There's a tip in this for any manufacturer who has to move bulky parts around a plant in other than usual routines.

The Whiting Corp. "wishbone" cupola charger shown in Fig. 10

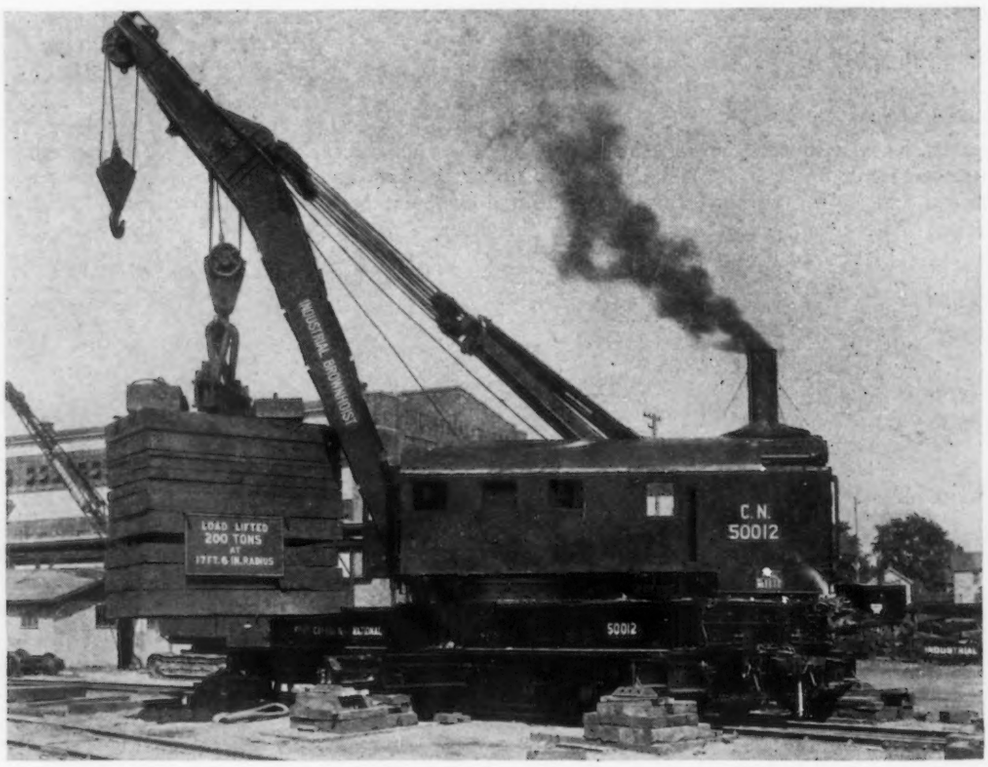

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FIG. 14—Industrial Brownhoist 200 ton railroad wrecking crane handling maximum load.

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is so called because the carrying hook is shaped somewhat like a huge wishbone, carried horizontally. The advantages is that the bucket of material carried on the far end of the wishbone hook is carried directly into the cupola, while the hoisting mechanism remains outside, unaffected by the high temperatures. The capacity of this equipment is two tons, and it serves two cupolas from the single crane runway.

Another Whiting Corp. specialty is the depressed type cross-over bridge as used in a Pittsburgh freight house. The table is here shown in the raised position, forming a bridge between two platforms to allow industrial trucks to run across the tracks from one platform to the other. In the depressed position, the tracks on the bridge match with the standard railroad tracks between the two platforms, permitting railroad cars to be run in to any required position alongside the platform. This particular bridge is two tracks wide.

Railroading seems to take up a large share of this portfolio. While we are on the subject, therefore, it will not be amiss to mention one more railroading specialty. The Whiting Corp. locomotive spotter in Fig. 12 is used on a large midwestern road. It is here shown spotting a heavy 2-8-4 locomotive by drawing in the coupling-rail.

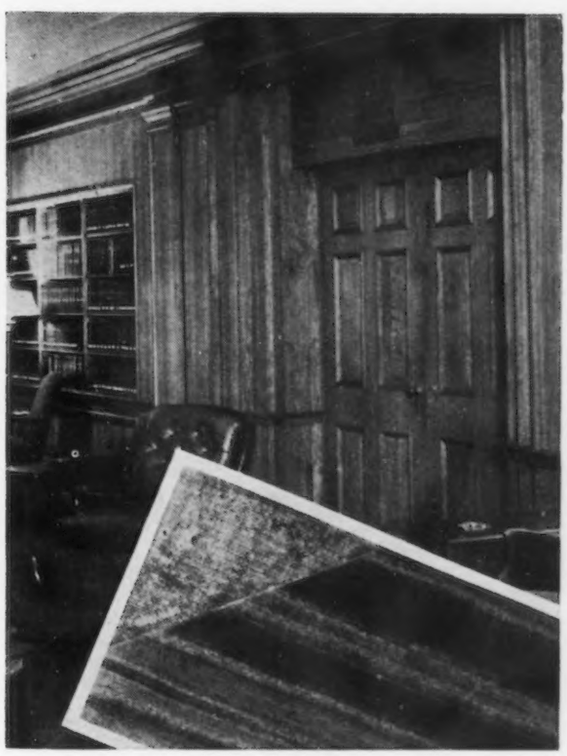
A unique use for an electric hoist is illustrated in Fig. 13. Two Cleveland Tramrail hoists are mounted in fixed positions on a building column, the cables running out to left and right to control the hoisting of oven doors. In such a use, the hoist operates as a winch.

Fig. 14 illustrates an Industrial Brownhoist Corp. wrecking crane. This giant is capable of picking up 200 tons at a point 17½ feet out from the center of the boom swing. Designed purely for emergency wrecking service, of course; but wouldn't it make a swell addition to Junior's model railway system?

Wood Veneers Bonded to Steel

A NEW building material, comprised of fine wood veneers backed up with and permanently cemented to a steel sheet, has been developed by the H. H. Robertson Co., Pittsburgh. Combining the warmth of wood with the fire resistance, strength and stability of steel, the material is especially suited for use in bulkheads, walls of public rooms, wainscoting, furniture, etc. The accompanying illustration shows its construction and its use as a wall material.

This new product, designated as Robertson Bonded Metal, is available in sheets up to 3 x 8 ft., and with the steel reinforcement in gages from No. 30 to No. 18. The sheets are supplied in 30 different types of wood surfaces and it is stated that they may be worked with metal-cutting tools, stamped, spot welded and bent without affecting the bond between the wood and metal backing. The adhesive used in joining the wood to the metal backing is a phenolic resin manufactured by General Plastics, Inc.



NEW wall panels combine wood veneers with backing of sheet steel.

Workers Donate Flagpole To Plant to Show Good Will

TO symbolize the many years of pleasant relations that have existed between management and employees of the All-Steel-Equip Co., Inc., Aurora, Ill., the employees, through the athletic association, recently presented to the company a flagpole with masonry monument and dedicatory plaque. The raising of the new flag on the pole was made the occasion of appropriate exercises at which the principal speaker was Representative Chauncey W. Reed, of the 11th Congressional district, Illinois. The All-Steel-Equip Co. is a manufacturer of steel office and factory equipment, electrical boxes and specialties.

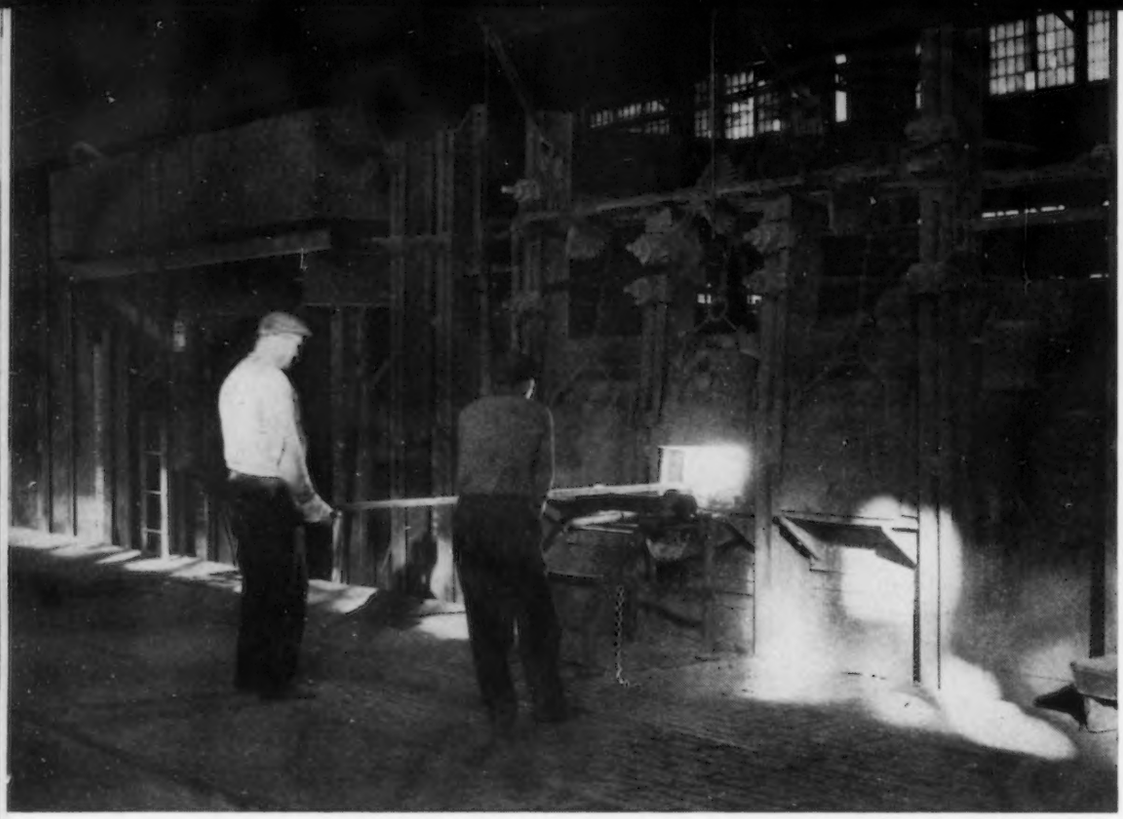


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FIG. 1 (at left)—The open hearth is hand charged with selected stainless scrap. Fig. 3 (below)—Swing grinders rout out imperfections in slabs.

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Stainless Strip Is

By T. W. LIPPERT
Metallurgical Editor, The Iron Age

o o o

A RELATIVELY new stainless steel producer, the Barium Stainless Steel Corp., Canton, Ohio, is prone to be proud of its position as the sole producer of corrosion-resisting alloys in the open hearth[1] and, also, of being the only company in this country directing its entire energy toward the production of one specialty, viz., stainless steel strip narrower than 16 in. (with occasional lots up to 24 in.), in all commercial gages, and all common analyses, both chromium - nickel and straight - chromium. At quick glance, such a specialization could possibly be construed as unnecessarily confining. However, an examination of statistics[2] shows that of the total output of 52,961 tons of finished stainless steel in 1936, approximately 12,534 tons, or almost 24 per cent, was made up of strip sizes. Equally significant is the fact that market demands for stainless steel continue to mount a steep curve, and final

[1] Simpson's top-fired open hearth apparently is still operated only experimentally by Bethlehem. Colvilles, Ltd., Glasgow, for years made straight-chromium grades in a basic open hearth of quite large capacity, using the Hamilton-Evans process (originally developed as an electric furnace practice). Recent advices from Scotland, however, indicate that the furnace has been idle for some time, apparently because of the poor demand for straight-chromium grades abroad. Krupp, in Germany, is using the open hearth for stainless, but the exact practice and quantity produced are unknown.

[2] "Stainless Steel Output for 1936," THE IRON AGE, May 6, 1937.

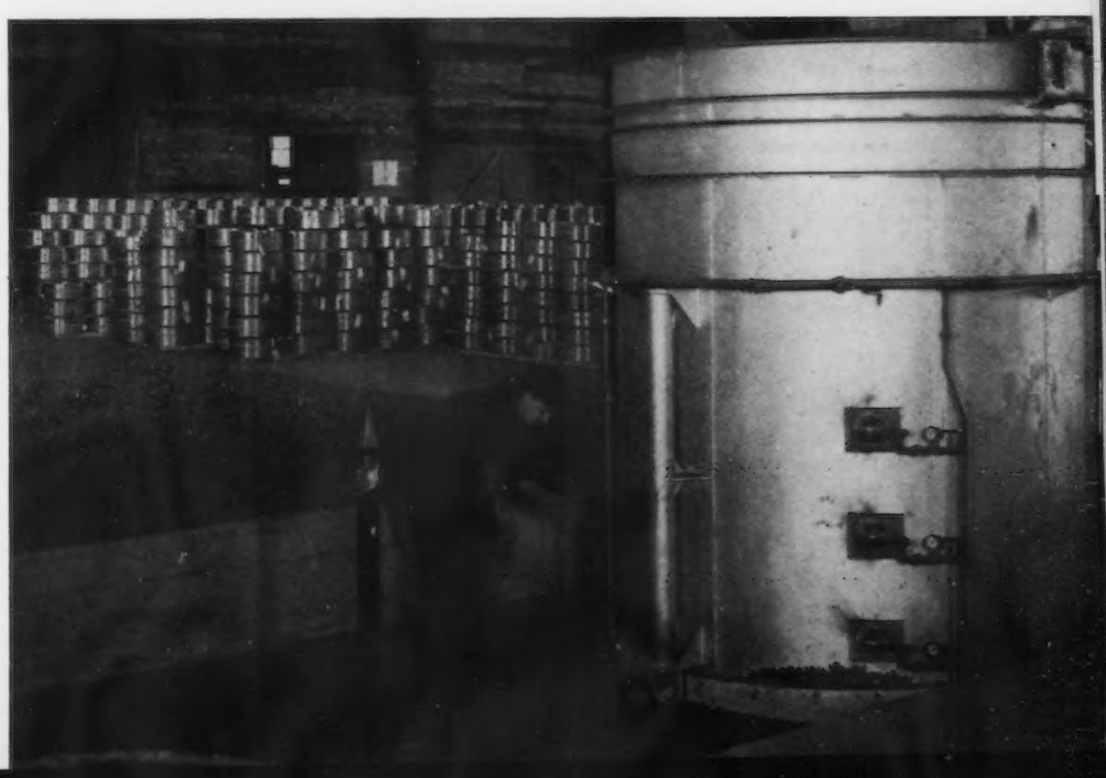
FIG. 2 (at right)—A 2100-lb. ingot is pressed down to slab size for subsequent hot rolling. Fig. 4 (below) — Bell-type gas-fired furnaces heat treat straight-chromium analyses.

Barium's Specialty

statistics on this year's production for the industry as a whole may show as much as a 30 per cent increase over 1936.

At the time the activities of the Canton company were first examined about a year ago,[3] it was described how a coal-fired open hearth of not more than 3½ tons capacity was the distinctive production feature. Two furnace practices were employed—the first and preferred procedure was a remelting of stainless steel scrap discreetly needled with pig nickel and low-carbon ferrochromium; the second was an approximation of conventional electric furnace procedure, using low-phosphorus steel scrap of the low-carbon open-hearth variety, driving the carbon down under an oxidizing slag, subsequently building up the entire nickel and chromium content with pig nickel and ferrochromium, and finally finishing off the heat under a disintegrating calcium silicate slag. This latter practice, of course, required a pretty high temperature, but roof life was surprisingly lengthy mostly because of the small furnace size.

In contrast to the practices of the Barium company of a year ago, the production cycle of the company today has been considerably altered, both by a marked redesign of existing equipment and the installation of a considerable volume of new machinery to integrate the finishing of the raw steel. Although visually inconspicuous, a revamping of the open-hearth design is of considerable significance, and is



[3] "Open-Hearth Stainless Steel," THE IRON AGE, Sept. 17, 1936.

said to have speeded up the melting time, simplified construction and repair and improved the controllability. The original design for coal firing necessitated the use of many special refractory sections, in itself somewhat expensive, and the automatic coal-fired rudimentary gas producers on each end of the furnace were unable to pump enough B.t.u.'s on to the hearth to give much better than an eight-hour melting cycle, from tap to tap. The coal firing has now been entirely discarded in favor of automatic natural gas firing, the result being a considerably simplified port design, a distinct increase in the furnace's capacity, a 4-in. elevation in the roof for slightly better thermal protection, and a use of only standard refractory shapes. Operating results so far have more than justified the alterations, the melting cycle has been speeded up to six hours, from tap to tap, life has been increased (one furnace has gone over 200 heats with but minor patching), the operation is cleaner and considerably easier to keep under accurate control.

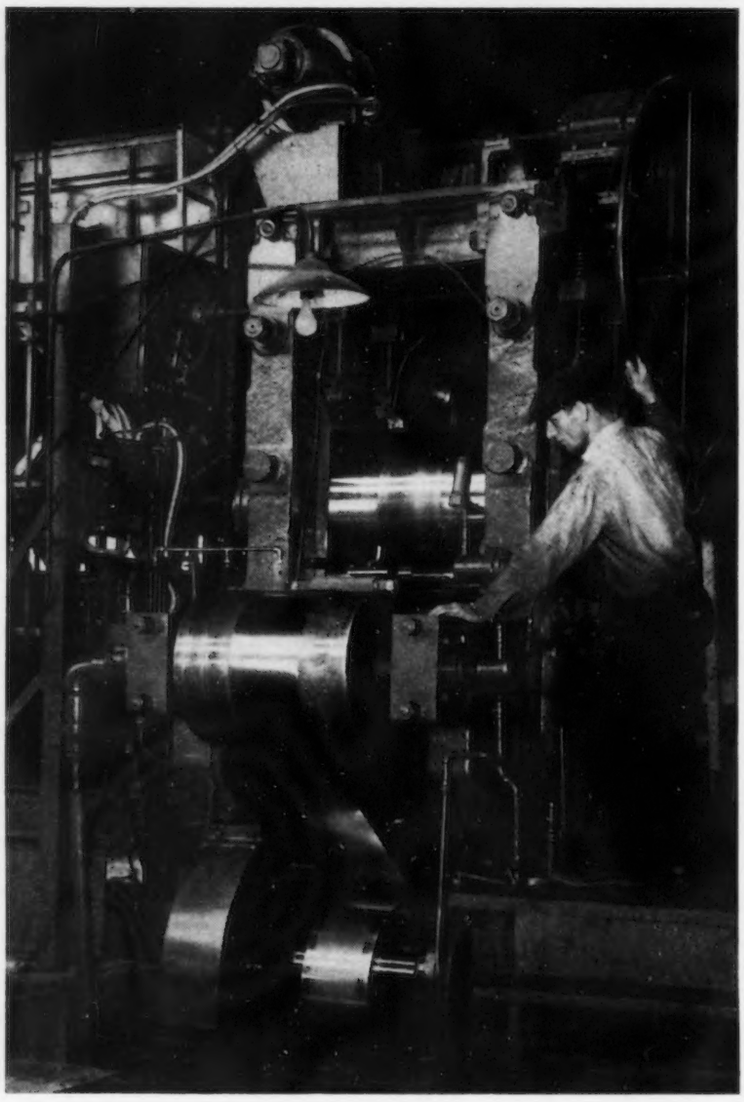


FIG. 5—A 30-in. Steckel mill cold reduces the hot-rolled stainless strip to finish gage.

The company estimates that its two open hearths now have a raw stainless steel capacity of close to 7500 tons yearly, which would indicate a possible strip production of about 3800 tons yearly, at full capacity. Outlets for this production will probably be largest in the stove and automobile industries, judging from the orders now being handled.

Complementing the two open hearths are two auxiliary units—one, a furnace operating at 1500 deg. F. to preheat nickel slabs and ferrochromium to prevent chilling of the bath when alloying additions are made; two, a drying oven operating at 400 deg. F. for driving the moisture out of the barium carbonate, fluorspar, chrome ore, and ferrosilicon, the result being a minimization of gas pickup by the bath.

As a year ago, the company today uses two open hearth practices, the remelting of scrap and the approximation of electric furnace practice with low-phosphorus steel scrap. At the moment, the former is employed practically exclusively, as would be expected in view of the way scrap prices have declined. A view showing hand charging of compressed bundles into the furnace is shown in Fig. 1; a second furnace may be seen in the far background.

When the scrap process is used no refining or carburizing is attempted in the furnace, and it is thus evident that the process depends entirely upon a source of low-carbon material for the charge. The process can handle straight stainless steel scrap, both of the mill variety in the form of crop ends and of the fabricating variety in the form of skeleton scrap, punchings, etc. This latter type of scrap is particularly difficult to handle in an electric furnace. In the furnace, the metal melts down quietly and rests on the hearth in a thoroughly molten condition, permitting all slag and dirt particles to rise to the surface. A particularly clean uniformly alloyed quality steel free of slag is thus available for tapping into the ladle.

After a final correcting addition of slab nickel and low-carbon ferrochromium has been added to the bath and thoroughly stirred, metal tests are taken to judge temperatures and other physical conditions, and at least one sample analyzed for a final check on carbon, chromium, nickel, etc. The bath is brought up to a proper pouring temperature, near 3000 deg. F., final deoxidizing additions are made in the furnace and the heat is poured.

As carried out, the melting process in the open hearth naturally shows practically no carbon pickup, and in this respect approximates remelting practice in an induction fur-

nace. On the other hand, in conventional electric arc furnace practice, carbon is continuously being thrown off from the electrodes, either as carbon or as carbon compounds, and some is thus added to the bath. Instead of having any difficulty in producing a stainless steel having under 0.10 to 0.12 per cent carbon, Barium regularly produces steel with 0.07 to 0.08 per cent carbon, and has on occasion held this analysis even lower. If higher carbons are desired for any reason, the usual practice of dosing with high-carbon ferrochromium is employed.

Not only is carbon low in the open hearth metal as tapped, due to the absence of carbon electrodes, but there is also a very low nitrogen content. In an electric arc furnace, the electrodes in the presence of some air continuously produce cyanogen, which not only carries carbon into the bath but also nitrogen, for which the chromium in the metal has considerable affinity. No such reactions take place in the open-hearth furnace — there is no opportunity for nitrogen pickup, and the metal on test has shown a very low content.

It has been stated that both carbon and nitrogen[4] are "hardeners" in stainless steel, and as both are kept at a low percentage there is considerable justification for Barium's claim of particularly deep drawing quality for its metal. It is even claimed that in certain instances one or more intermediate anneals have been eliminated during fabrication.

Metallographic studies of the open-hearth metal have shown it to be uniformly clean and free from the finely divided or dispersed non-metallic inclusions often found in stainless in the past. This is attributed to the quiet or "dead melting" practice in the open-hearth furnace. It is on these three characteristics — low-carbon, low-nitrogen and cleanliness—that Barium bases its claims for excellence in fabrication and corrosion resistance.

Two ingot sizes are used, 1800 lb. and 2100 lb. For the most part, these ingots on stripping show an excellent surface, but occasionally some slivers, folds or pin cracks have to be chipped out. Most of the ingots, however, go directly to the reheating and soaking furnaces shown in the background in Fig. 2, to be picked out by the manipulator some 12 to 15 hr. later (depending on the thickness) and slabbed down on a hydraulic press, as in the foreground of Fig. 2. The slabs measure about 10 ft. long, 6 to 16 in. wide and 2½ in. thick. On cooling, the slabs are carefully inspected for seams, slivers, surface scabs, etc.; they all must be ground out, for stainless steel, unlike plain carbon steel, does not self-heal on hot rolling, but rather imperfections fester and grow progressively worse. Two of the swing grinders in the slab-conditioning department are shown in action in Fig. 3, dressing up slabs prior to hot rolling.

Hot reduction of the slabs follows standard practices entirely, and the semi-finished coils generally are about 175 ft. long, 0.120 in. thick and varying in width up to 16 in., with a few measuring 24 in. wide. These hot-rolled coils, if they are of a chromium-nickel analysis, are spot welded end-to-end and continuously passed through a 30-ft. gas-fired normalizing furnace at a speed varying from 4 to 16 ft. per min., depending on gage and width. The furnace atmosphere is slightly oxidizing. To handle straight-chromium analyses, the Barium company has installed a battery of six bell-type gas-fired annealing furnaces, each of which will handle a 5000-lb. charge in an 8-hr. cycle. The furnaces work with a slightly reducing atmosphere, and one in operation is shown in Fig. 4 (the

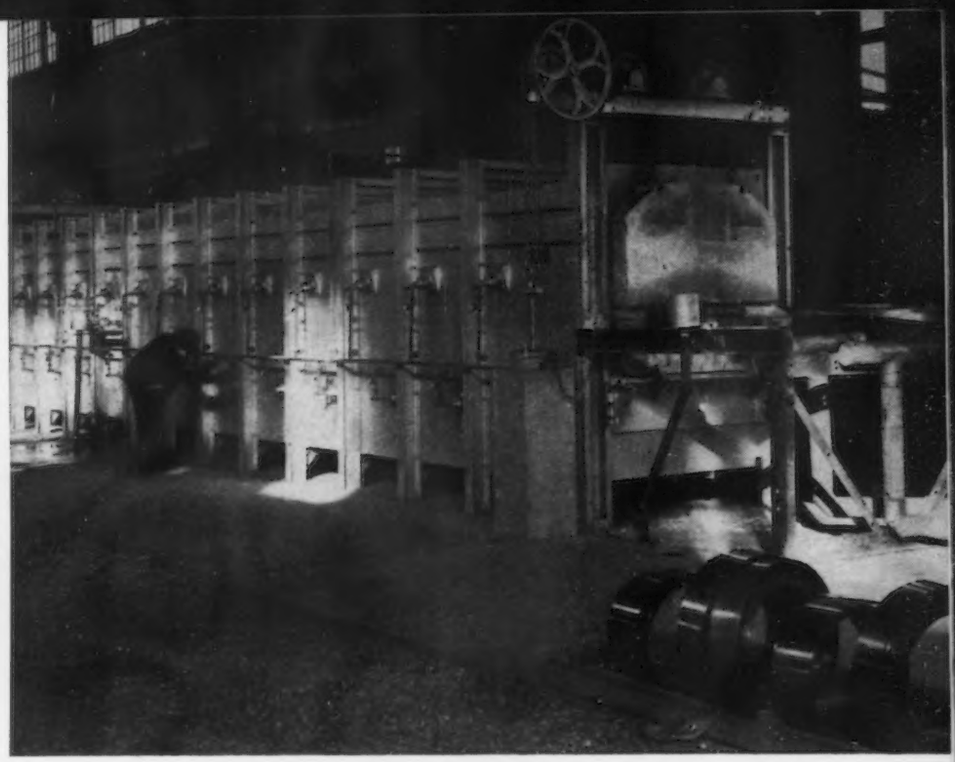


FIG. 7—The stainless strip is given a final heat treatment in this high-speed gas-fired muffle furnace.

FIG. 6—This small cold mill handles sample orders and is used for a certain amount of set pass work on production tonnage.

[4] "The Book of Stainless Steels," page 184. "Metal Working in Power Presses," E. V. Crane, Transactions A.I.M.E., 1931. "Relation Between Plastic Deformation in Deep Drawing and Tensile Properties of Various Metals," M. H. Sommer, Transactions A.I.M.E., 1934.

stacks of finished cold-rolled strip in the background are fully finished and tagged for shipment).

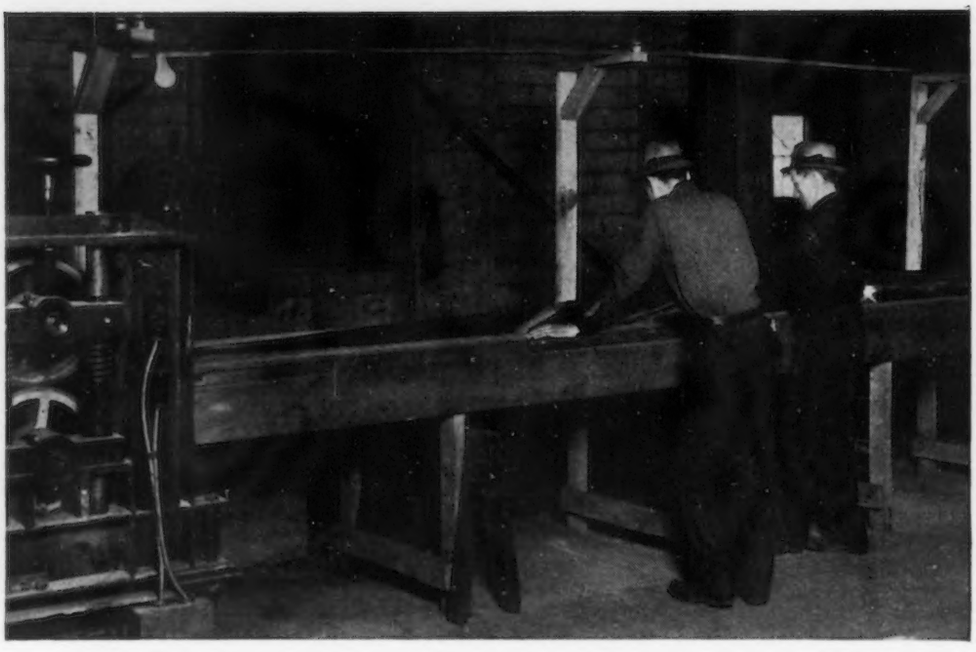


FIG. 8—Following a final pickle, the stainless strip passes over this table for inspection. It is wound on spools and passes along to the slitting department.

Whether softened in the continuous or the bell-type furnace, the stainless strip next passes to a two-high breakdown mill for a light pass to crack up the surface scale. This mill is equipped with a down-coiler, which steps up production considerably. With scale loosened or cracked off, the strip next is again spot welded end-to-end and sent through a 90-ft. electrolytic pickling tank and 30 ft. of still pickling tank, whence it emerges bright and clean and ready for cold reduction to finish gage.

The 30-in. Steckel cold reducing mill, shown in Fig. 5, working continuously, is able to handle all the production tonnage in the plant. For small orders of special width or gage, for working up customer samples, or even for a certain amount of set-pass work on production tonnage, the company has found the three-high, 14-in. cold-reduction mill shown in Fig. 6 indispensable. In this particular view, the furnace shown in the background is the normalizer for hot-rolled chromium-nickel strip, mentioned previously.

Cold-reduced to final gage, the strip next is given its final normalizing in the continuous gas-fired muffle furnace shown in Fig. 7. This furnace is somewhat longer than in many other plants—40 ft.—and the speed with which the strip is whipped through is surprisingly fast, being as high as 35 ft. per min. for stock 16 in. wide, either as one strip or in multiple strands. The delivery end of the furnace is shown in the immediate foreground, and the reflection indicates the high finish on the strip at this stage of the cycle. The blowers underneath the strip sufficiently cool the material so that it may immediately enter a continuous electrolytic pickler, 130 ft. in length, wherein the surface is given a light cleaning, and on exit is scrubbed and dried, subsequently to pass onto the inspection table shown in Fig. 8. At this stage of the manufacturing cycle, the strip is practically fully finished, and the high finish on the surface is apparent from the reflections shown in Fig. 8.

In some instances, the strip as it passes over the inspection table shows up with surface faults, in which case it is passed on to the continuous paper-belt polishing machine shown in Fig. 9, a unique machine used for the first time in the Canton plant. This same machine is often used with coarser grit to grind the surface of hot-rolled strip, if after pickling it is not in good enough condition to cold roll. In Fig. 9 note the spot welder to the left for fastening coils end-to-end to pass through the grinder, and also note in the distant background furnace men pouring a row of ingots. The sander (or polisher) itself is unique in that a paper belt carries the abrasive, rather than a cloth belt, and several other innovations have been incorporated to speed up output but at the same time keep operating costs as low as possible.

The journey of the strip, either directly from the inspection table or from the polishing machine, is then either to the shipping department or, in many cases, to a two-high 30-in. set pass mill, according to what customer specifications dictate. Following a set pass, the strip then goes to the shipping department. A battery of five slitting machines, capable of handling all types of demands, trim the edges of the strip and slit it into a variety of widths demanded by users. Subsequently the strip is coiled with the usual continuous protective interleafing strip of paper, wired and tagged and is ready for shipment. In all the finishing operations, after the strip goes across the inspection tables on to spools, provisions are made to continuously wind up the intermediate layer of protective paper every time a spool is uncoiled. In this way, it is possible to use and reuse paper for some length of time, a minor but very definite saving in cost, and a salvage which is ignored in many plants.

The Barium company is exceptionally fortunate in that it has had plenty of room to expand, and the result has been an ideal layout of equipment so as to achieve the ultimate in straight-line production. The main building of the plant is made up of four longitudinal bays, each bay serviced by an overhead traveling crane.

A railroad spur into the first bay brings raw materials directly to the open-hearth floor. After pouring, the ingots pass down the second

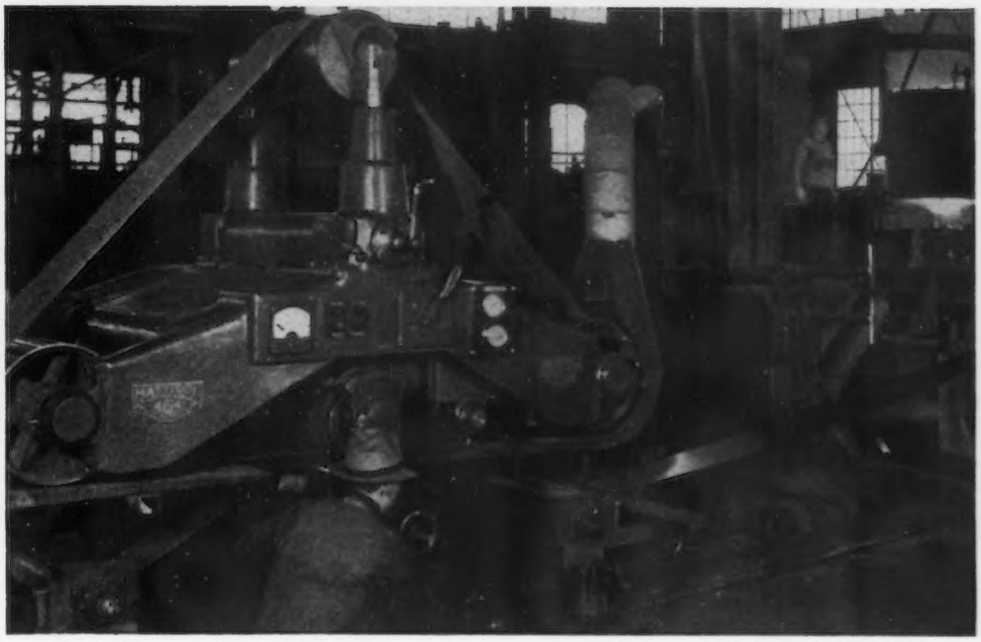


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FIG. 9—This machine, of an entirely new design, carries abrasive on a paper belt, and is used either to polish the finished strip or to grind out imperfections in semi-finished material.

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bay to the reheating furnace and the hydraulic press and thence to the swing grinders. The hot-rolled strip passes up the third bay, through the annealing furnaces, the rough scale-cracking rolls, the continuous pickler and the continuous belt grinder. The path of the material then is looped into the fourth bay, first through the Steckel mill, then the continuous normalizer, the continuous electrolytic pickler, and set mill, and thence to the slitting machines in the shipping department, wherein another railroad spur handles shipments of finished coils.

The plant is serviced by a power plant in a separate building; a complete chemical, physical and metallographic laboratory is housed in a second building, and a third building houses all administrative offices. Complementary equipment in the main plant includes a roll-grinding machine, a hydraulic scrap baler, a small machine shop and a small wood-working shop. Operations in the plant are under the direction of Messrs. Noble and Charles Jones, associated for many years with the West Leechburg Steel Co.

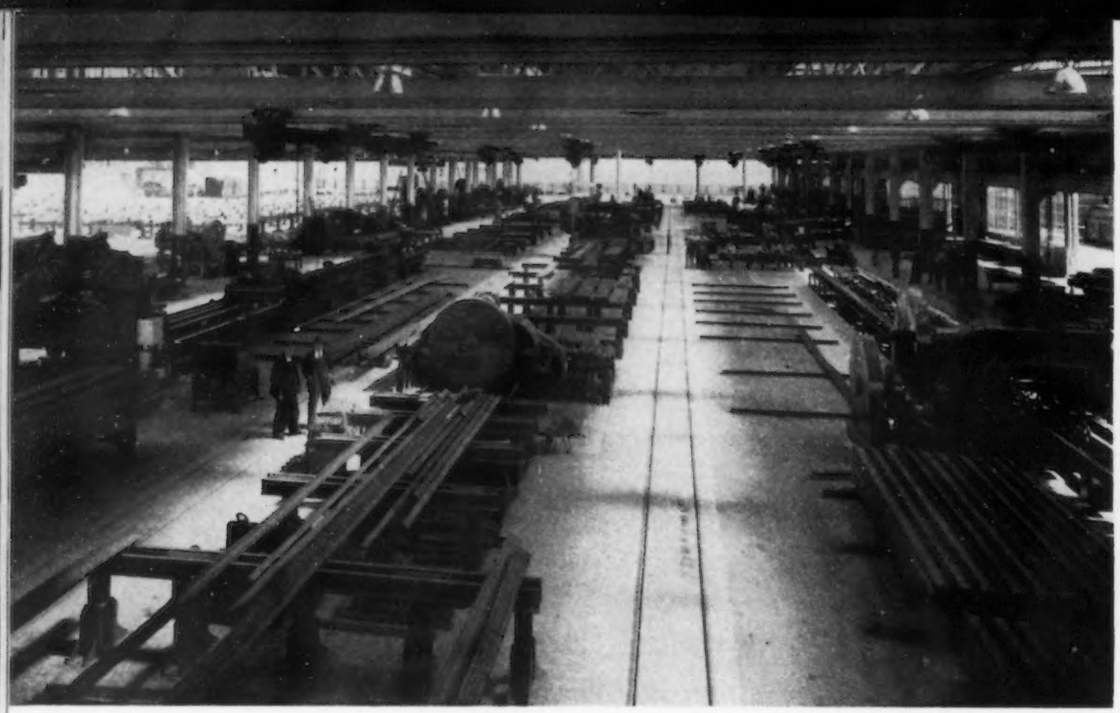
Record Increase In A.S.A. Membership

ROUNDING out its 19th year as national standardizing agency, the American Standards Association at its annual meeting, held Dec. 1 at the Astor Hotel, New York, reported the largest increase in membership of any year since the association was formed.

The new affiliates are: Association of Iron and Steel Engineers; Automobile Manufacturers Association; American Society of Refrigerating Engineers; American Society of Heating and Ventilating Engineers; Heat Exchange Institute; Hydraulic Institute; National Elevator Manufacturing Industry, Inc.; U. S. Independent Telephone Association; American Council of Commercial Laboratories; Associated General Contractors of America; Structural Clay Products, Inc.; Brick Manufacturers Association of America; Asphalt Shingle and Roofing Institute; Insulation Board Institute; American Trucking Association; and the National Retail Dry Goods Association. The last named, with 5800 store members, is the first retailing group to affiliate.

Election of officers resulted in the reelection of Dana D. Barnum, consulting engineer, New York, president; E. A. Prentis, vice-president, Spencer, White & Prentis, New York, vice-president; and F. M. Farmer, vice-president, Electrical Testing Laboratories, New York, chairman, standards council. R. P. Anderson, secretary, division of refining, American Petroleum Institute, was elected vice-chairman of the standards council.

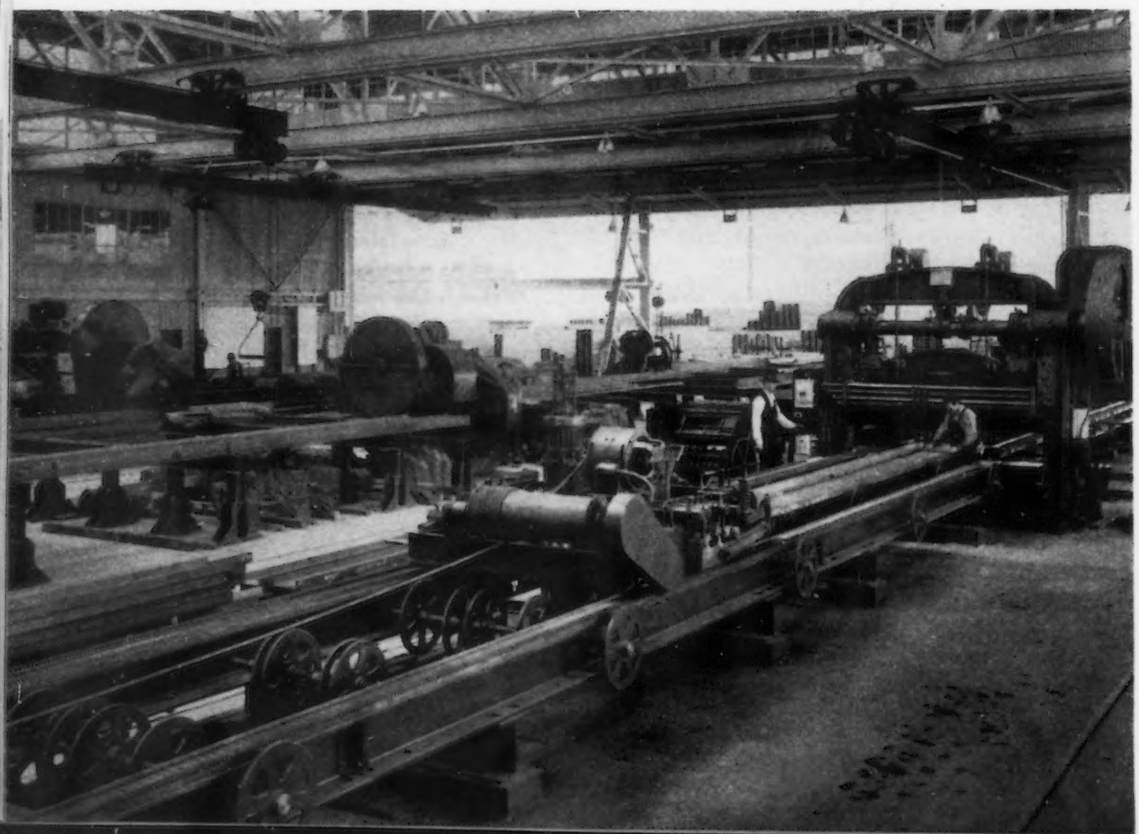
The 59 standards approved during the past year include a new American standard for large rivets. Four important standards which provide for greater interchangeability in the use of certain machine tool elements have also been completed. The safety code for power presses, one of the first and most important standards in the field of industrial safety, has also been revised during the year. With those approved this year, the number of American standards approved since the association was organized in 1918 totals 382.



LOOKING east. The main building is 105 by 400 ft. and houses 10 new machines produced by the Thomas Machine Mfg. Co. of Pittsburgh. These include: a semi-automatic beam punch with a 36-in. beam capacity; two large spacing tables; an odd hole punch; double-acting angle shear; turntable gate shear of 96-in. capacity; bulldozer; duplicating punch with quadruple head; and a swipe. A Dreses drill mounted on a track completes the array of equipment. This machinery is arranged for the utmost convenience for material handling and is placed throughout the building so that ample space for operations is allowed around each unit. Strictly structural work is carried on here.

Pacific Coast Structural

STREAMLINED efficiency in every detail characterizes the recently completed structural steel shop of the Moore Dry Dock Co., Oakland, Cal. At the cost of some $500,000 this modern plant involves the largest installation of plant machinery by a Pacific Coast steel fabricator in recent years. Moore Dry



CLOSE-UP of one of the two Thomas spacing tables with punch arrangement for channels, plates and angles. The machine has a capacity of 30 holes punched at a time. All the new machines were furnished through the Bulloti Machinery Co., San Francisco.

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AT the western end. A receiving yard crane runway 80 by 275 ft. is served by a 10-ton, double-hook Whiting crane. The shipping yard runway is 80 by 385 ft. and is served by another Whiting crane with a 20-ton capacity and a 10-ton auxiliary. On the north side of the central bay is a lean-to where most of the specialty work for barges, gold dredges and similar equipment is done. A deep-throat plate punch with rolls, hydraulic press, bulidozer, bending slabs and plate shear form the integral items of machinery. To the south of the principal bay operating offices are located, as well as departments for burning and welding special small work, a compressor room, a rivet making room and rivet bins.

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Shop Modernized

Dock has long been prominent on the Pacific Coast in the fabrication of steel shapes and plates and also maintains a dry dock for the repair of small and large ships. B. J. Osborne, manager of the structural shop, supervised the installation of the new plant.

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ILLUMINATION of the building has been worked out so that it is possible to work at night with complete absence of shadows. Since all sides are open and the roof is equipped with numerous skylights, no artificial lighting is needed during the day. One of the more convenient features is the ease of welding. Gas and electric outlets are located on all columns in the shop and in trenches throughout the entire length.

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Exports (In Gross Tons)	October		Ten Months Ended October	
	1937	1936	1937	1936
Pig iron	66,297	246	719,666	1,936
Ferromanganese and spiegeleisen	3	110	1,629	444
Other ferroalloys	235	40	2,338	1,997
Scrap, iron and steel	184,547	119,568	3,466,055	1,704,723
Scrap, tin plate	338	1,240	25,810	13,013
Waste-waste tin plate	733	4,549	28,947	33,310
Pig iron, ferroalloys and scrap	*252,153*	*125,753*	*4,244,445*	*1,755,423*
Ingots, blooms, billets, sheet bars	35,730	2,770	227,981	16,268
Ingots, etc., alloy steel incl. stainless	218	....	6,994	....
Skelp	3,892	16,003	73,889	49,285
Wire rods	7,182	2,775	50,750	29,912
Semi-finished steel	*47,022*	*21,548*	*359,614*	*95,465*
Bars, plain and reinforcing	13,969	5,618	116,127	44,766
Bars, alloy steel	466	....	5,332	....
Bars, stainless steel	9	....	189	....
Iron bars	45	53	2,001	904
Plates, plain and fabricated	59,067	13,920	347,982	65,456
Plates, alloy steel	14	....	2,404	....
Plates, stainless	4	....	143	....
Sheets, galvanized steel	7,841	7,789	62,903	48,273
Sheets, galvanized iron	347	138	4,317	1,350
Sheets, black, plain steel	27,273	13,132	233,174	112,321
Sheets, alloy steel	81	....	4,624	....
Sheets, stainless	42	....	1,047	....
Sheets, black iron	1,331	350	9,812	5,950
Hoops, bands, strips, plain steel	7,715	5,400	94,099	50,685
Hoops, bands, strip steel, alloy	67	....	1,034	....
Hoops, bands, strip steel, stainless	103	....	547	....
Tin plate and taggers' tin	36,098	19,396	270,180	190,646
Terne plate (including long terne)	332	208	4,424	2,736
Structural shapes, plain material	8,650	7,418	117,954	49,834
Structural material, fabricated	4,672	3,400	31,989	16,352
Sheet piling	1,635	734	6,406	2,683
Tanks, steel	4,521	1,727	28,965	18,872
Steel rails	14,420	7,475	93,111	61,239
Rail fastenings, switches, spikes, etc.	2,345	1,382	15,033	10,829
Boiler tubes	3,107	1,094	12,969	6,045
Casing and oil line pipe	9,849	3,683	78,506	22,263
Pipe, black and galv., welded steel	2,095	1,483	34,100	15,884
Pipe, black and galv., welded iron	616	579	5,937	3,404
Plain and galvanized wire	4,568	4,805	49,772	38,334
Barbed wire and woven wire products	3,105	3,476	34,615	29,919
Wire rope and other products	1,239	766	14,519	6,788
Nails and tacks	1,103	971	18,724	9,263
Bolts, nuts, rivets and washers except track	937	713	9,642	5,432
Other finished steel	121	212	2,357	1,778
Rolled and finished steel	*217,787*	*105,922*	*1,714,938*	*822,006*
Cast iron pipe and fittings	1,614	1,470	26,864	15,472
Malleable iron screwed fittings	632	473	4,393	2,989
Carwheels and axles	1,437	539	14,044	6,486
Castings, iron and steel	861	903	10,655	8,741
Castings, alloy steel, incl. stainless	199	....	1,435	....
Forgings, plain	801	310	7,706	3,271
Forgings, alloy steel, incl. stainless	105	....	781	....
Castings and forgings	*5,649*	*3,695*	*65,878*	*36,959*
Total	522,611	256,918	6,384,875	2,709,853

Imports (In Gross Tons)	October		Ten Months Ended October	
	1937	1936	1937	1936
Pig iron	11,870	7,264	95,908	144,871
Sponge iron	24	181	2,434	1,590
Ferromanganese[1]	656	3,914	23,216	22,037
Spiegeleisen	222	4,532	17,116	35,339
Ferrochrome[2]	20	10	260	31
Ferrosilicon[3]	345	6	2,729	453
Other ferro-alloys[4]	....	....	52	526
Scrap	7,684	18,532	77,941	115,671
Pig iron, ferroalloys and scrap	*20,821*	*34,439*	*219,656*	*320,518*
Steel ingots, blooms, etc.	6	4	130	83
Billets, whether solid or hollow	335	107	1,821	722
Wire rods	1,282	1,924	13,779	16,303
Semi-finished steel	*1,623*	*2,035*	*15,730*	*17,108*
Concrete reinforcement bars	14	151	3,766	3,414
Hollow steel bars	295	169	2,159	1,767
Merchant steel bars	1,928	4,342	39,918	33,231
Iron slabs	....	....	1	....
Iron bars	116	165	1,743	1,172
Boiler and other plate	9	45	213	421
Sheets, skelp, and saw plate	142	2,503	8,485	19,540
Die blocks or blanks, etc.	5	16	98	174
Tin plate	15	36	206	181
Structural shapes	4,097	6,817	68,649	47,952
Sheet piling	....	132	2,161	2,329
Rails and track material	140	595	7,813	6,832
Welded pipe	615	354	8,079	5,103
Other pipe	1,166	5,549	28,729	25,034
Cotton ties	....	41	454	1,670
Other hoops and bands	1,310	2,225	23,237	19,980
Barbed wire	2,367	1,289	14,629	13,228
Round iron and steel wire	308	329	4,131	4,108
Telegraph and telephone wire	1	1	17	37
Flat wire and steel strips	288	218	3,102	2,383
Wire rope and strand	309	268	3,127	2,070
Other wire	99	381	3,085	1,734
Nails, tacks, and staples	1,010	1,997	14,047	19,717
Bolts, nuts, and rivets	69	12	546	425
Horse and mule shoes	38	60	379	360
Rolled and finished steel	*14,341*	*27,695*	*238,774*	*212,862*
Malleable iron pipe fittings	....	36	404	157
Cast iron pipe and fittings	113	199	2,729	576
Castings and forgings	288	105	3,979	1,054
Total	37,186	64,509	481,272	552,275

[1] Manganese content. [2] Chrome content. [3] Silicon content. [4] Alloy content.

Iron and Steel Imports Continue at Low Level

IMPORTS of semi-finished and finished iron and steel products into the United States during October continued at a low level, amounting to only 29,502 gross tons, valued at $1,743,474, according to preliminary information released by the Metals and Minerals Division, Bureau of Foreign and Domestic Commerce.

In comparison with the low September totals (28,505 tons valued at $1,908,645), a 3.5 per cent tonnage increase was registered, but from a value standpoint an 8.7 per cent decline resulted. Against the October, 1936, trade of 45,977 tons valued at $2,220,797, sharp declines of 35.8 per cent and 21.5 per cent respectively were recorded.

Pig iron in October remained the leading product imported on a tonnage basis, with an 11,870-ton total, and came mostly from British India (7015) and the Netherlands (4119). Next ranking were structural shapes, 4097 tons, taken principally from Belgium.

Receipts in the initial 10-month period aggregated 403,331 tons, valued at $21,280,294, in comparison with the corresponding figure

(CONTINUED ON PAGE 90)

October Imports of Iron and Manganese Ores

(In Gross Tons)

	Iron Ore		Manganese Concentrates, 35 Per Cent or Over	
	1937	1936	1937	1936
Canada	84	33,981	....	....
Cuba	33,000	44,000	....	2,880
Chile	152,750	87,150	....	....
Spain	....	....	....	....
Norway	6,086	7,177	....	....
Sweden	36,860	16,836	....	....
French Africa	....	....	....	....
Russia	....	....	15,327	12,360
India	....	....	1,953	4,421
Brazil	....	....	6,719	3,683
Gold Coast	....	....	13,378	11,639
Other countries	26,937*	4,026	....	11
Total	255,717	193,170	37,377	34,994

*Includes 17,858 tons from Australia.

United States Imports of Pig Iron by Countries of Origin

(In Gross Tons)

	October		Ten Months Ended October	
	1937	1936	1937	1936
United Kingdom	....	220	100	5,286
British India	7,015	3,241	57,875	48,039
Germany	....	420	510	4,549
Netherlands	4,119	2,408	25,269	54,318
Canada	736	63	6,098	9,656
France	....	....	....	....
Belgium	....	....	....	973
Norway	....	347	875	2,420
Sweden	....	260	600	689
Russia	....	305	4,581	18,495
All others	....	....	....	446
Total	11,870	7,264	95,908	144,871

Open-Fired Bright Annealing Furnaces For Copper

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By J. W. TIELKING and W. LEHRER*

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THE successful use of open-fired controlled atmosphere furnaces was made possible by the proper application of dependable and accurate proportioning devices for mixing the air and the gas.

Although in recent years the conception of a controlled atmosphere furnace has become rather specific and implies a separation of the gases surrounding and contacting the work to be heated from the products of combustion coming directly from the heating burners, the general definition of a controlled atmosphere furnace is one in which the work to be heated and cooled is at all times surrounded by a gas of a constant composition. As the automatic proportioning devices mix the air and the gas in constant proportions for all operating conditions, the products of combustion resulting from the burning of this air-gas mixture remain unchanged in composition. If the nature of the work is such that its surface will remain bright when heated in an atmosphere of straight products of combustion, an open-fired furnace will meet every requirement of a modern controlled atmosphere furnace. This is the case in the heat-treatment of copper.

It is well known that copper is the metal presenting the least difficulties in bright annealing. A straight flue gas, slightly on the reducing side so as to prevent the presence of any free oxygen, will successfully bright anneal and even deoxidize copper. The large percentage of water vapor in the products of combustion does not impair the surface of copper. As a matter of fact, for many years copper has been and still is being bright annealed in an air-free steam atmosphere. By proper purification of the raw gas and by careful adjustment of the air-gas mixture, sulphur stains on the copper can be entirely eliminated. The products of combustion issuing directly from the open-fired burners are, therefore, an ideal bright annealing atmosphere for copper so that no muffle or its equivalent are required. Consequently such an open-fired furnace is a true bright annealing furnace.

The successful continuous operation of the open-fired bright annealing furnace involves, of course, the same problems of sealing the work openings at both ends of the furnace that are encountered in a muffle type controlled atmosphere furnace. The knowledge and experience gained in balancing the atmosphere in the latter type of furnaces naturally was of greatest value. In this respect, it is interesting to note that the open-fired bright annealing furnace for cop-

(CONTINUED ON PAGE 136)

* J. W. Tielking, plant engineer, Mueller Brass Co.; W. Lehrer, development engineer, Surface Combustion Corp.

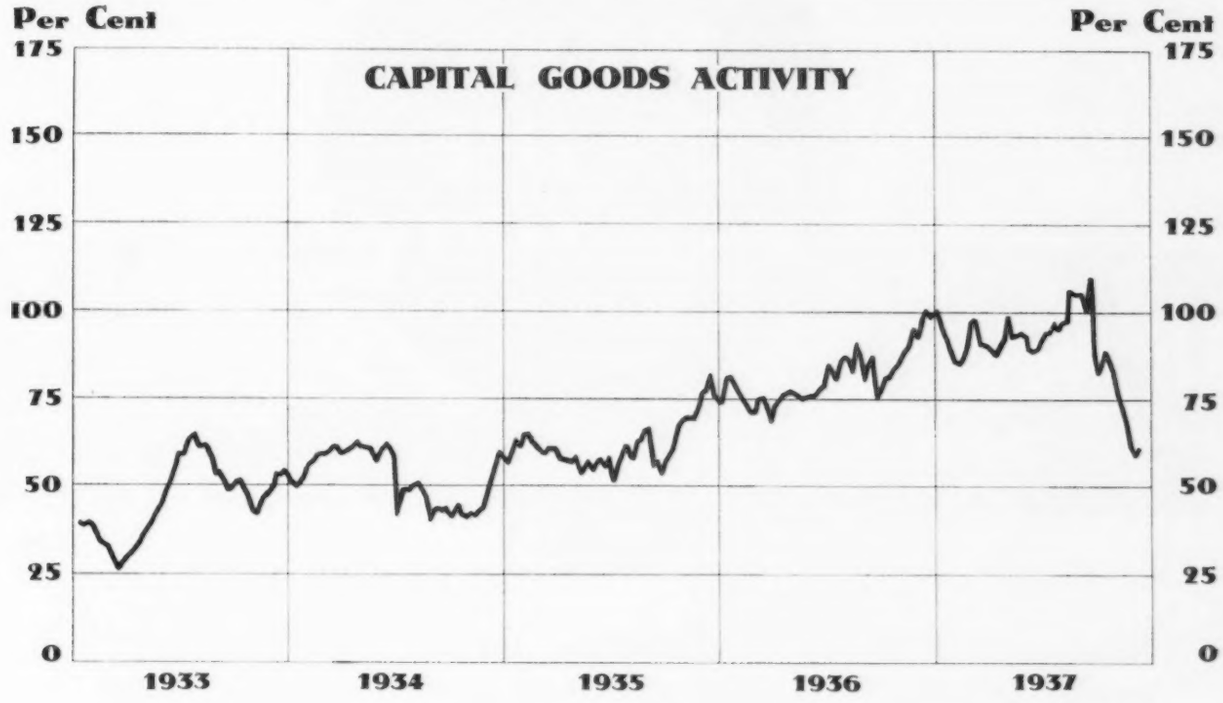
Current Metal Working Activity

Latest Data Assembled by THE IRON AGE from Recognized Sources.

	November, 1937	October, 1937	September, 1937	October, 1936	Ten Months, 1936	Ten Months, 1937
Steel Ingots: (gross tons)						
Monthly output[a]	2,153,781	3,392,691	4,301,869	4,534,246	38,060,388	45,891,460
Average weekly output[a]	502,047	765,844	1,005,110	1,023,532	873,546	1,056,676
Per cent of capacity[a]	38.22	58.31	76.52	78.15	66.69	80.67
Pig Iron: (gross tons)						
Monthly output[b]	2,006,724	2,892,629	3,410,371	2,991,887	24,556,395	33,114,269
Raw Materials:						
Coke output[c] (net tons)		4,262,946	4,679,875	4,299,900	37,395,300	45,999,617
Lake ore consumed[d] (gross tons)		4,203,873	5,157,411	4,384,908	35,818,890	49,344,994
Castings: (net tons)						
Malleable, production[e]		42,953	52,728	51,778	459,088	542,037
Malleable, orders[e]		34,810	41,662	55,521	451,147	362,260
Steel, production[e]		.....	83,047	74,775	653,202	.....
Steel, orders[e]		.....	57,414	59,431	673,256	.....
Finished Steel (net tons)						
Trackwork shipments[a]		6,137	8,101	5,547	58,478	84,028
Fabricated shape orders[f]		46,912	132,432	130,989	1,320,867	1,381,381
Fabricated shape shipments[f]		149,308	163,541	156,717	1,292,315	1,415,403
Fabricated plate orders[a]		31,942	31,484	33,791	392,554	373,914
U. S. Steel Corp. shipments[g]		792,310	1,047,962	1,007,417	8,875,124	11,749,156
Ohio River steel shipments[h]		89,750	122,600	145,065	930,446	1,097,395
Fabricated Products:						
Automobile production[i]		369,193	175,620	264,495	4,148,857	5,040,060
Construction contracts[j]		$202,081‡	$207,072‡	$225,768‡	$2,267,396‡	$2,509,095‡
Steel barrels shipped[a]		938,443	725,699	924,797	6,971,797	8,476,910
Steel furniture shipments[a]		$1,918‡	$2,084‡	$1,777‡	$15,487‡	$21,807‡
Steel boiler orders[a] (sq. ft.)		611,720	661,372	968,845	8,701,981	8,623,644
Locomotives ordered[k]	13	0	8	22	180	278
Freight cars ordered[k]	1,625	21	1,195	1,310	38,664	47,826
Machine tool index[l]		152.0	210.7	136.5	127.5†	180.8†
Foundry equipment index[m]		185.2	231.8	173.8	160.4†	224.6†
Non-Ferrous Metals: (net tons)						
Lead shipments[n]		39,292	53,850	59,210	411,016	508,060
Lead stocks[n]		100,646	90,742	183,430	.....	.....
Zinc shipments[o]	32,221	40,345	47,737	53,963	445,570	507,890
Zinc stocks[o]	42,984	25,817	13,517	68,744	.....	.....
Tin deliveries[p] (gross tons)	5,195	8,210	8,245	6,005	61,730	73,450
Refined copper deliveries[q]		44,592	66,229	75,919	614,772	751,393
Refined copper stocks[q]		181,842	144,321	178,018	.....	.....
Exports: (gross tons)						
Total iron and steel[r]		522,611	542,740	256,918	2,709,853	6,384,875
All rolled steel[r]		264,809	213,990	127,470	917,471	2,074,552
Finished steel[r]		217,787	173,902	105,922	822,006	1,714,938
Scrap		184,547	252,713	119,568	1,704,723	3,466,055
Imports: (gross tons)						
Total iron and steel[r]		37,186	37,071	64,509	552,275	481,272
Pig iron[r]		11,870	7,911	7,264	144,871	95,908
All rolled steel[r]		15,964	13,796	29,730	229,970	254,504
British Production: (gross tons)						
Pig iron[s]		769,600	726,600	670,300	6,367,100	6,929,100
Steel ingots[s]		1,133,600	1,163,000	1,060,500	9,678,500	10,681,900

†Three months' average. ‡000 omitted.

Source of data: [a] American Iron and Steel Institute; [b] THE IRON AGE; [c] Bureau of Mines; [d] Lake Superior Iron Ore Association; [e] Bureau of the Census; [f] American Institute of Steel Construction; [g] United States Steel Corp.; [h] United States Engineer, Pittsburgh; [i] Preliminary figures from Automobile Manufacturers Association—Final figures from Bureau of the Census, U. S. and Canada; [j] F. W. Dodge Corp.—37 Eastern states; [k] *Railway Age*; [l] National Machine Tool Builders Association; [m] Foundry Equipment Manufacturers Association; [n] American Bureau of Metal Statistics; [o] American Zinc Institute, Inc.; [p] New York Commodities Exchange; [q] Copper Institute; [r] Department of Commerce; [s] British Iron and Steel Federation.



THE IRON AGE Weekly Index of Capital Goods Activity

(1925-27 = 100)

Week Ended Dec. 4	60.8	Same week 1934	47.1
Preceding Week	59.0*	Same week 1933	49.0
Same week last month	72.2	Same week 1932	36.5
Same week 1936	92.5	Same week 1931	50.2
Same week 1935	76.9	Same week 1930	78.0
		Same week 1929	99.4

* Revised.

RECOVERY of automobile assemblies from the holiday week decline and less-than-seasonal losses in two other factors advanced THE IRON AGE seasonally adjusted index of capital goods activity 1.8 points to 60.8 per cent of the 1925-27 average for the week ended Dec. 4. The gain in automobile assemblies raised the index figure of this factor 10.3 points to 68.8, or 0.6 points below its pre-holiday position. Although carloadings of lumber products were 1688 cars below the preceding week, this loss was less than the seasonal experience and the index number of this component advanced 4.1 points. The third gain recorded for the week was in heavy construction awards which advanced 0.6 points on the basis of several heavy awards which have advanced the 13-week moving average against a falling trend. The index position of steel ingot production was lowered for the eleventh consecutive week and now stands at 36.9 per cent of the 1929 average. Continued curtailment of activity in the Pittsburgh area caused a loss of 4.8 points in this series, dropping the adjusted index figure to 49.5.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	30.0	—3.0
Automobile production (number of cars and trucks)	86,173	+27,218
Railroad loadings of forest products (number of cars)	25,117	—1,688
Pittsburgh industrial production and shipments (index number)	59.9	—4.8
Construction contracts awarded (total value)	$41,680,000	—$30,801,000

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from *Engineering News-Record*.

THIS WEEK ON THE ASSEMBLY LINE

. . . Hand-to-mouth buying more than doubled in month, bringing 78 per cent of Detroit purchases within 30-day range.

o o o

. . . Alfred P. Sloan proposes five steps in approach to restored confidence and better business.

o o o

. . . Governor Murphy endorsed by central labor body as mediator to end strife between AFL and CIO.

o o o

. . . Union leader attacks seniority systems as restrictions on workers as well as on industry.

DETROIT, Dec. 6. — November showed a disconcerting retrogression in buying policy in the automotive area. Hand-to-mouth buying reached 52 per cent compared with 23 per cent in this classification during October. The 30-day buying group became 26 per cent, compared with 27 per cent the previous month. This, however, puts a total of 78 per cent of the buying within the 30-day range, compared with only 50 per cent in this range a month ago. These figures, resulting from a survey of the Detroit Purchasing Agents' Association, show 60-day buying as the policy of 15 per cent of those reporting to the association and 90-day buying practiced by only 7 per cent.

Michigan's industrial area is like a huge furnace into which industry and labor have put much in the passing years. The seething and burning and clouds of smoke have been viewed by the rest of the nation with some wonder. But in the last week there have been two pours, each worth testing. One is industry's suggestion; the other is a labor union proposal to bring AFL and CIO to peace.

Five steps in the restoration of confidence to remove fear that is the main obstacle to the general revival of American enterprise were proposed by Alfred P. Sloan, Jr., chairman of the board of the General Motors Corp. In three of his proposals he hit constructively at labor problems. Outstanding in the minds of many who read his speech last Friday to the Association of Life Insurance Presidents was the fifth point. "If a minimum wage and a maximum work week are to be established on a national basis, the standards should be determined by law—not by bureaucracy." This is a farseeing attitude but is particularly pertinent to the General Motors problem because the union in its negotiations during the last year has been vociferous and determined to set up national pay rates throughout all General Motors plants in the nation. When Mr. Sloan said "there ought to be a law" he was not theorizing, nor was he theorizing in another of his suggested steps when he urged amendment of the Wagner Act.

"No law that prejudices unfairly the interests of one group as against another can ever stand the test of time. It is wrong morally and economically. It is particularly objectionable where the groups are closely inter-related," Mr. Sloan said.

"The workers within industry, when associating themselves together in the form of unions, must accept the same degree of responsibility as do other groups who respect the rights of others; to obey the law; to honor their contracts and recognize their just share of the industry's productivity."

Other points in his suggested approach to the solution of current problems are:

1. The development of cooperation and mutual respect, especially in industrial management and the Government.

2. Balancing of the Government's budget and reducing expenses of Government.

3. Elimination or sharp reduction of capital gains tax; a com-

promise on the undistributed profits tax.

Murphy May Mediate

Meanwhile, Governor Frank Murphy, who played a leading role during the auto industry's labor strife last winter, was endorsed as the mediator in the factional fight between the American Federation of Labor and the Committee for Industrial Organization. With his reputation as a friend of labor, there should be no difficulty in winning the members of both organizations to support this plan. Delegates at the semi-monthly meeting of the Detroit and Wayne County Federation of Labor heard the proposal last week from Frank X. Martel, the federation president, and adopted it unanimously. Martel proposed that if John L. Lewis and William Green, now endeavoring to bring about a settlement between the two labor union factions, should find themselves unable to settle all points in dispute, Murphy should be called in. Even political enemies of Murphy concede that he has demonstrated time and again his ability to bring opposing groups into conference and to hold them together until they have buried the hatchet and reached a working agreement. His failure to take more drastic action at Flint last winter while General Motors workers sat down and his similar laxity in the Chrysler strike brought untold opposition, but it was realized even then that he was the important factor in staging the conferences that did bring peace. The confidence of the CIO and AFL has been earned by Murphy and could be used now to good advantage in eliminating the inter-union warfare that may follow failure of Green an Lewis to bury the hatchet.

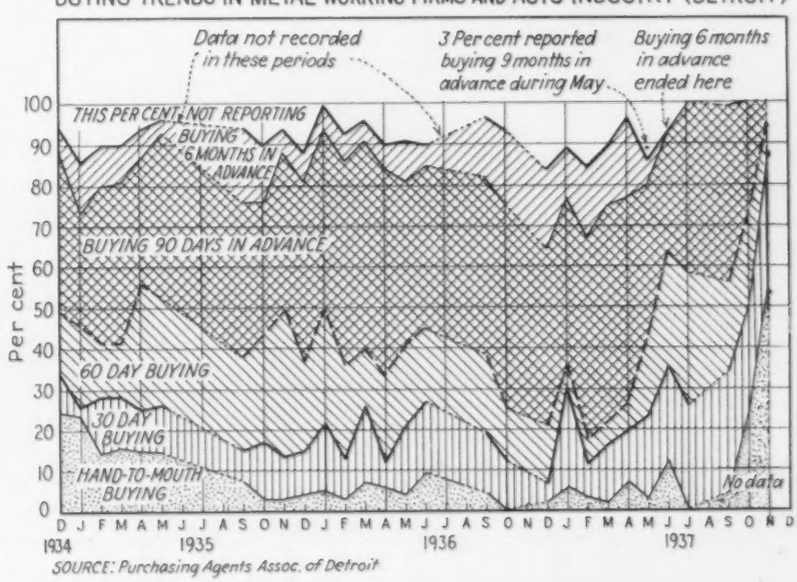
Spurt in Production

Assembly lines showed a new spurt last week and output advanced to 86,173 units, compared with the low of 58,955 the previous week, according to Ward's Automotive Reports. The output was well below the figure of 101,660 for the comparative 1936 week. While output will undoubtedly continue below 1936 totals, the activity at Ford should continue to grow from the 12,500 units assembled last week and offset even possible declines from the rest of the industry. During the past week Chevrolet was peak producer, turning out 27,500 cars. Plymouth produced 10,500.

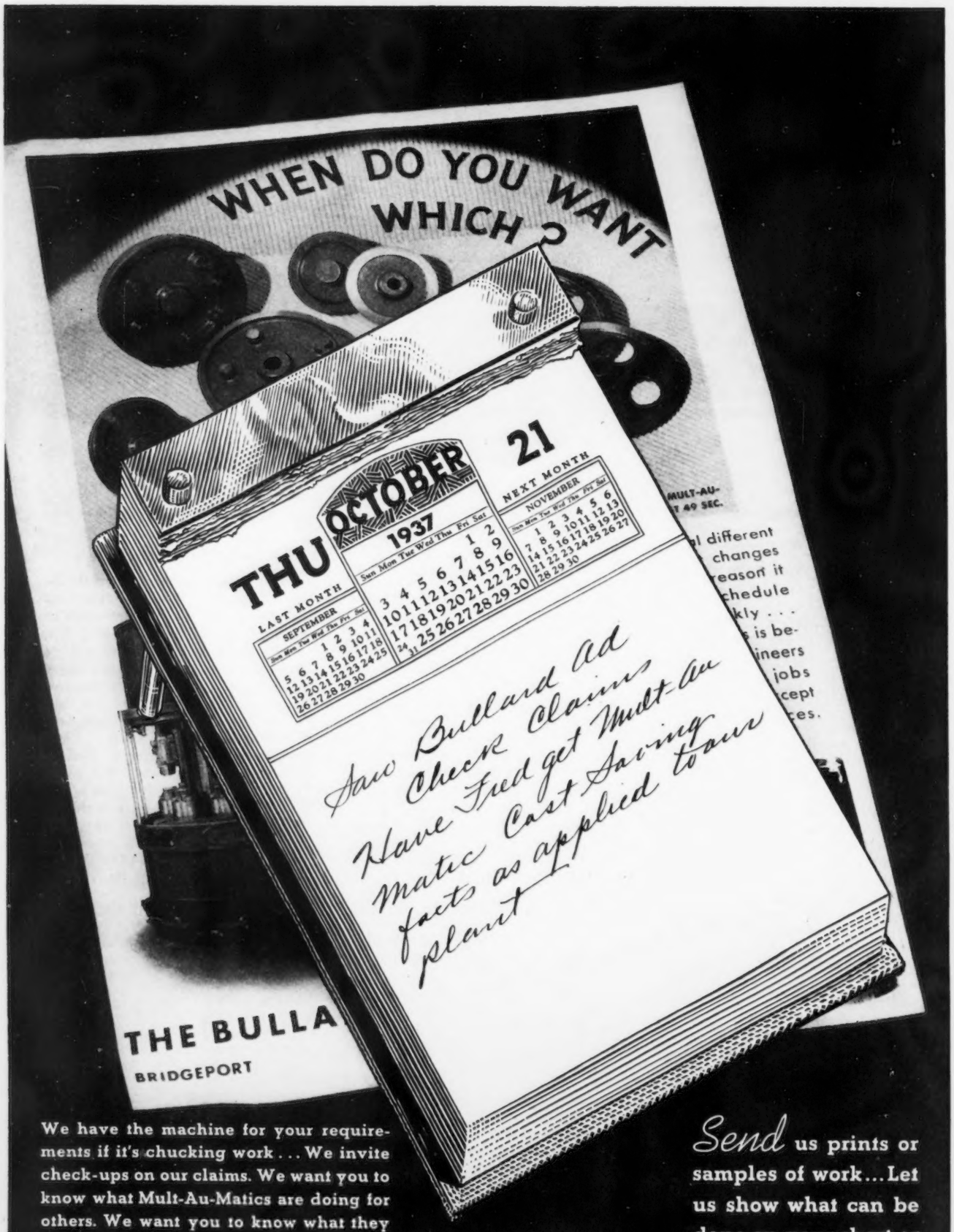
Chevrolet Doing Well

Chevrolet, together with Buick, has had such a good reception at the hands of the public that it moved C. E. Wilson, General Motors vice-president, to reveal to 1000 plant executives last week that 32,000 employees in these two plants in Flint have not yet felt the effects of the general business recession. He did declare, however, that other General Motors automobile plants face curtailment of the present rate of production this month, admitting that dealer stocks are ahead of the corresponding time a year ago and that the corporation has built all the cars

BUYING TRENDS IN METAL-WORKING FIRMS AND AUTO INDUSTRY (DETROIT)



SOURCE: Purchasing Agents Assoc. of Detroit



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ahead for stock that dealers can take. In as large degree as possible, Wilson said, the curtailment would involve shortening of the work week rather than layoffs. As is generally known, current retail deliveries are running about two-thirds of the volume a year ago and used car stocks are much heavier.

Mr. Wilson also took advantage of the occasion to deal a blow to wild assertions that industry had deliberately "sold" itself into a depression to embarrass the Administration. In this he has unexpected support within the UAW. A long time ago, William Munger, managing editor of the *United Automobile Worker* and important adviser to the union's executives, pooh-pooh'ed the idea that business was on strike against either labor or the Administration. He declared then—not for publication but rather informally—that the tax on undistributed surplus and the corporate gains tax were unreasonable restrictions on business that had resulted in stifling capital, preventing it from making the investments in new enterprise necessary to stimulate progress. A verbatim report of his opinions would have fitted well in the middle of the speeches made by the General Motors executive.

An instance where industry might well use a union leader's arguments to put across a point it has long advocated is furnished by Matthew Smith, national secretary of the Mechanics Educational Society of America. He is an outstanding opponent of the restrictions of seniority systems and has his arguments well formulated.

"In the past," he says, "a 5 per cent unemployed reservoir meant that 30 per cent of the workers shared in the enforced idleness. With strict seniority, the chances are that a 5 per cent unemployed army will be isolated permanently from any share in the nation's employment schedule. The ironical thing is that unions dare not institute seniority in their own organizations. Imagine the furor there would be if Bill Green insisted on being president of the AFL because of seniority in that job."

Difficulties in Seniority Plan

Lay-offs in the last few weeks in the auto industry have contributed several illustrations of the impossibility of longer continuing a strict seniority plan. One automobile factory operating a new transmission plant with a relatively new crew (compared with the rest of the factory) furnished an outstanding example of management's reason for objecting. Under the plant-wide seniority system the lay-off virtually stripped this department of men and it is reported that in the resulting shift of personnel, the foremen had every variety from grinder hand to sheet-metal worker trying to run gear shapers. In one of the plants where Smith's union has a contract, a grievance recently arose when one worker claimed 15 minutes' seniority over another. Smith traces the history of the seniority system through the Wolman Labor Board, which invented the merit clause, providing that job preference according to service should be tempered by the merit of the worker. This clause has been abolished in the automobile industry, although it is still retained on many agreements affecting the steel industry.

"Now," Smith says, "a worker's economic life is controlled by his position on the job expectancy list of some company. Credit agencies fix the limit of a workman's credit by the same list. Mobility of American labor has been absolutely destroyed. Now a man with a good seniority rating does not dare leave his job even if tempted by a 10 or 20 per cent increase in wages. Workers do not bother about getting more experience. The only important thing is to get firmly established in the upper branches of the seniority tree. Labor unions haven't time to talk of wages, hours or victimization cases; all their time is consumed by a long procession of people claiming unfair seniority treatment. The agonizing part of the question is the impossibility of unanimity. When a seniority question is decided in some worker's favor, it is obviously settled at the expense of another worker. Both these workers being in the same union, one can imagine the lack of harmony in union meetings. The only way out of this is an increase of unemployment benefits. If the weekly payments are made high enough, the workers will fight for annulment of their seniority classifications."

Industrial Notes

The trend to special ventilation systems in automobiles is illustrated by Hupp which joins Nash in offering a conditioned air system as optional equipment. * * * The Hercules diesel engine will get wider distribution as a result of plans to set up branch sales and service outlets in Mid-Continent oil fields, to be followed, probably, by outlets in Eastern oil fields and in California. * * * General Motors'

(CONTINUED ON PAGE 102)

ROY E. COLE, vice-president in charge of Studebaker engineering, inspects the plastic award given the Studebaker Corp. for its original development work on non-metallic timing gears. Studebaker engineers were awarded third prize in a recent competition.

WASHINGTON. . . . . .

. . . New Deal blames "high prices" of commodities, still below FDR's 1926 objectives, for trade slump.

o o o

. . . Runs both ways at once as FTC fights alleged fixing while other U. S. agencies seek to peg farm quotations.

o o o

. . . Labor board, stung by charges its hearings are "burlesque", moves to silence editorial criticism.

o o o

By L. W. MOFFETT
Resident Washington Editor
The Iron Age

o o o

WASHINGTON, Dec. 7.—The New Deal professes not merely to believe but to be convinced that prices of a number of basic products are too high and definitely specifies numerous commodities, among them cement, steel, copper and aluminum.

It makes no difference that the President formerly insisted that prices must be raised to the 1926 level and not one of the products named has attained that level, based on the Bureau of Labor Statistics index.

Using 1926 as 100, the Labor Bureau's October, 1937, indexes were: cement, 95.6; iron and steel, 99.7; copper, 86.5 and aluminum, 74.3. As a matter of clarity it may be pointed out that the Bureau's iron and steel index is made up of both pig iron and rolled steel, and when some items are set up separately they show somewhat lower and others somewhat higher 1926 average prices than those of October 1937.

Among products whose present indexes are above the 1926 average are structural shapes, 114.9; steel bars, 122.7; plates, 119.7; wire, 113.2; sheets, 104.1; basic pig iron, 127.7. On the other hand among products indexed below the 1926 level are steel rails, 98.8; black pipe, 96.2; cold rolled strip steel, 87.7 and Southern foundry pig iron, Birmingham, 94.5. THE IRON AGE composite finished steel price average for 1926 was 2.409c. as against the present average of 2.605c., the latter an increase of $3.92 per net ton, or 8.3 per cent.

Claim Prices Too High

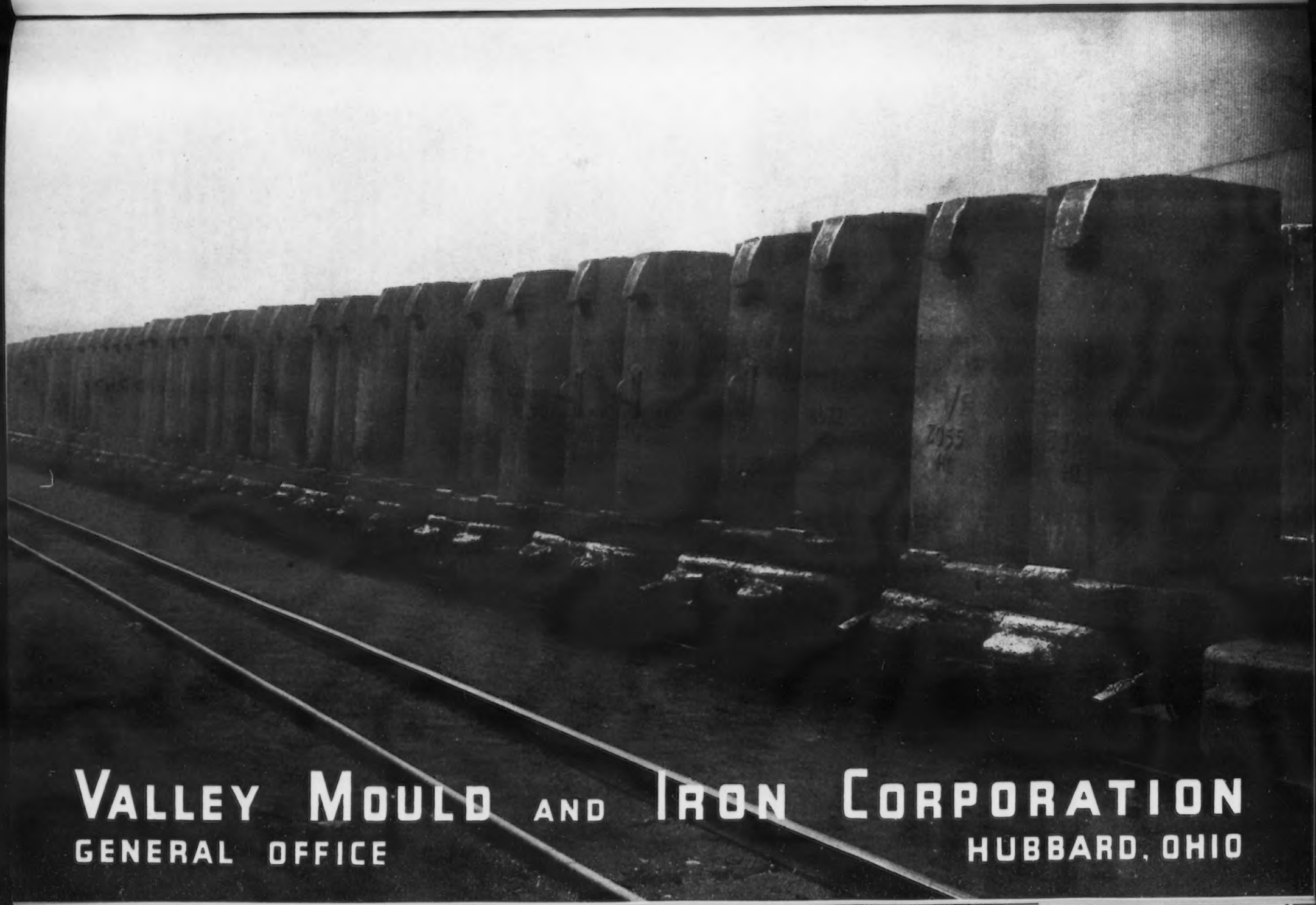
Despite this showing on prices, the Administration insists they are too high, and as some suspect, turns to them in seeking a reason to shift the blame for the "recession." Thus it tries to hurdle its own responsibility for high costs of labor and materials by means of planned economy. Higher wages and shorter hours is a New Deal objective to which no reasonable objection can be made. On the contrary, it is desirable, provided industry has the capacity to pay. But pushed to excess the objective is destructive to both industry and labor.

In steel, the price increase has been mild compared with wage and tax increases. Since September, 1933, the average hourly earnings of steel employees have risen about 52 per cent to the highest level on record, more than 86c., according to the American Iron and Steel Institute. According to the same source, taxes on a finished ton of steel rose to $3.33 in 1936 from $2.78 in 1929.

Prices Blamed For Slump

But, as pointed out, the Administration contends that prices of basic commodities are too high and not only have been a big factor in halting business but must be reduced if the proposed housing and industrial construction programs are to succeed as is hoped. Some of the more conservative Administration representatives think that if steel and other industries reduced prices, it would be a "splendid gesture" as they put it, which would stimulate wide scale buying.

Not all but a portion of them recognize the fact that declining prices in these basic commodities have the effect of depressing rather than increasing the market because of consumer reaction. This reaction is to withhold purchases on the theory that a downward spiral has developed and by delaying pur-


VALLEY MOULD AND IRON CORPORATION
GENERAL OFFICE
HUBBARD, OHIO

chases lower prices can be obtained.

Favor Price Pegging

Those who recognize that factor admit that it would also be "splendid" if the reduced prices could be pegged. Thus the buyer would have no incentive to remain out of the market. On the contrary, it is urged he would have an incentive immediately to come into the market because he would know the minimum price was available with a possible upward trend.

Moreover, it is further contended, he would be assured a competitor could not get a better price and this is even more important than the price itself, assuming the prices were "reasonable," whatever that may mean.

However, those who affect to see the desirability of "pegging" prices readily conceive the incongruity of such a suggestion. For they have in mind that the Administration, while on the one hand is peace pow-wowing with private industry to pull the country out of the Roosevelt "recession," is on the other hand lashing out bitterly against "big business" on a wide-scale anti-trust crusade, directed at so-called monopolistic practices in industry.

Early Report Expected

Both the Department of Justice and the Federal Trade Commission are evangelizing in this popular political field and the latter's inquiry is expected to bring forth a report to the President early in the regular session of Congress and probably will be tied in the Administration move to tighten further the anti-trust laws.

The FTC has not indicated the scope of its Presidentially-inspired "investigation." There is little doubt but that it will cover various, if not all, commodities which the Administration constantly harps about, claiming that they are identically-priced through collusion. The principal means of arriving at the prices, Administration officials contend, is by use of the basing point system used by numerous industries, steel, cement, lumber, copper, paint, paper, rubber, chemicals, etc.

FTC Wants F.O.B.

The FTC hearing in its case against the Cement Institute, begun last Wednesday in Washington, is of course, a case against all these industries. It is a renewed effort, on a much enlarged basis, to compel abandonment of all delivered price systems and substitution of the f.o.b. mill system of quotation on which the FTC has implacably insisted.

The hearings themselves, which undoubtedly will be extensive and expensive, will be of no value further than letting the affected industries again go on record in preparation for a court contest, for it is being conducted by a body whose mind already is made up and may be confidently expected to issue a cease and desist order.

In the meantime the Department of Justice has added the Western Union Telegraph and the Postal Telegraph-Cable Co., to its string of big anti-trust cases, supplementing its drives against oil and aluminum, and apparently hunting for further game. At the same time, the Administration has fixed prices of bituminous coal and, politically papping the farmer, is engaged in a gigantic monopolistic scheme to not only fix prices but to control production of agricultural products, a plan of economic scarcity whose first cost alone will set back the consumer to the tune of no one knows and cannot know how much.

Conservative estimates range from $500,000,000 to $1,000,000,000.

It's Same Consumer

This is the same consumer who is given such delicate Administration solicitude over prices of industrial products. This New Deal racing in opposite directions at the same time doesn't add up, but long ago the Tory idea that two plus two equals four was thrown into the discard, and reconciling Administration likewise is no longer seriously undertaken.

But the New Deal ought to add at least one more alphabetical soup agency to its endless string of tax-eating, business harassing organizations. It has been suggested it might well be the DAA—Devil's Advocate Administration. It would have its hands full arguing bad cases and proving that two plus two equals five or any other sum that represents its "objective."

Navy Opens Bids On Two Vessels

WASHINGTON, Dec. 7. — The New York Shipbuilding Corp., Camden, N. J., was low bidder on a 9000-ton destroyer tender for the Navy to be built within three years. The bid was for $11,690,810 or $10,737,555 on an adjusted price basis with allowances for labor and material cost variations.

The Federal Shipbuilding & Dry Dock Co., Kearny, N. J., bid $18,150,000, or $17,150,000 on an adjusted price basis.

For an 8300-ton seaplane tender, the New York Shipbuilding Corp., submitted bids of $10,506,000, $10,391,750 and $10,831,770 on three different designs. On an adjusted price basis, the figures were $9,505,000, $9,490,750 and $9,943,000, respectively.

Three companies submitted estimates to supply the engines for the seaplane tender. They were the American Locomotive Co., New York, which bid $2,255,000; the Hooven, Owens, Rentschler Co., Hamilton, Ohio, $1,468,444; and the Nordberg Mfg. Co., Milwaukee, $1,973,000.

Under the third deficiency act, which authorizes construction of the vessels, at least one of the ships would be built at a Government yard, although Navy Department aides said that the President, after comparing the bids with Navy Yard estimates, could direct otherwise if the action was considered to be in the public interest.

Government Hearing On Basing Point System Gets Under Way

WASHINGTON, Dec. 7.—Renewing its siege against the so-called basing point system of quoting prices, the Federal Trade Commission last Wednesday began hearings on its complaint against the Cement Institute.

Promising to be extensive, the proceeding is highly important since, while formally directed against the cement industry, it actually is a move against steel and numerous other industries which are using the basing point system.

The commission also has pend-

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SUPER-SERVICE RADIALS

ing a complaint against the Cast Iron Soil Pipe Producers' Association involving the Birmingham-plus system. The purpose of the FTC, as in its original basing point system case directed against the steel industry more than a decade ago, is to compel industry to quote prices on a f.o.b. mill base. So revolutionary in its possibilities is the move that it unquestionably will be fought out in the courts.

It is taken as a matter of course that the FTC will issue cease and desist orders in its pending cases—that is, both the cement industry's multiple basing point system and the cast iron pipe industry's single basing point system. Manifestly, too, it is the purpose to make the orders apply to all industries using either the multiple or single basing point system.

Readily realizing the significance of the case the Cement Institute and its 75 constituent members are represented by a large group of eminent counsel. Many of the companies are represented by the New York law firm of Donovan, Leisure, Newton & Lumbar, with one member, George S. Leisure, directing the case for his firm.

The Cement Institute, in a statement issued on the eve of the hearing, declared that since the issue has been drawn the cement industry and the Cement Institute "hope that the Federal Trade Commission will proceed with a thorough study not only of the marketing methods which exist in the cement industry but also of the possible effect of imposing untried theories on industry."

The hearing is in charge of Examiner John W. Norwood. Appearing as chief attorney for the FTC is Walter B. Woodin.

Many see the FTC drive as a part of the New Deal move against "big business," to be fitted in with the Department of Justice's forthcoming anti-trust legislation and predict that the legislation will seek to compel abandonment of the basing point system with substitution of a f.o.b. mill system of quotation—similar to the Wheeler anti-basing point bill.

Linked To Inquiry

The New Deal technique also apparently is to tie the basing point case in with its assault on so-called "monopolistic practices" inquiry being made by the FTC by Presidential direction. So-called collusive bids and identical delivered prices, blame for which is placed largely on the basing point system, have been seized upon by the Administration as slowing down business revival and as an obstacle in inaugurating its housing program.

This red herring was dragged across the trail by Mr. Woodin in his opening statement at the cement case.

"It is not too much to say," Mr. Woodin stated, "that the success of the pending Governmental efforts to revive industry and increase employment through the housing program rests upon the theory that underlies this complaint. For it is obvious that, with prices and production under monopolistic restraint, increased demand, however contrived, can only fortify the forces of monopoly."

Attacking the cement industry, Mr. Woodin said it calculates delivered prices, "not from the actual place of shipment, as such, but from a limited number of so-called basing points." He contended that

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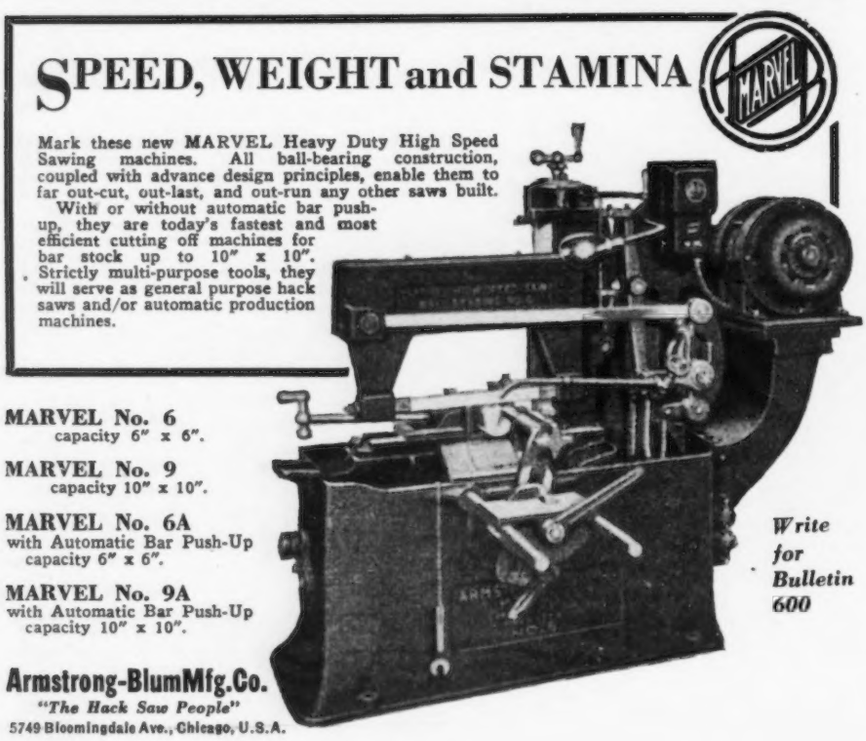
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this frequently involves the addition of imaginary freight to the basing point price. Declaring that these delivered prices are calculated only in terms of all-rail freight, Mr. Woodin said the industry takes no chances that its various members will calculate the freight differently and thus arrive at different delivered prices.

Provides Rates

The institute provides them with rates that are to be used, right or wrong, Mr. Woodin continued.

"Since truck transportation tends to upset the stability of delivered prices calculated on the all-rail freight bases, we find the industry seeking to deprive the public of the economy and convenience of truck transportation on cement. This creates the anomaly of an industry that is one of the chief beneficiaries of road construction opposing the use of roads to haul its own product and thereby reducing its consumption," he declared.

Mr. Woodin criticized the quotation of identical delivered prices and said that a necessary reflex and incident of the identity in delivered prices thus accomplished is a wide variation in the mill prices realized by the mills from customers differently located. This is charged in the complaint as unlawful price discrimination.

Few Alternatives

"The theory of the complaint as to the public interest is essentially the theory of competition as the only acceptable regulator of price," said Mr. Woodin. "The only present alternatives are to permit price control by private monopoly or to substitute drastic Governmental regulation. The first is unacceptable to the consumer; the second is unacceptable to industry."

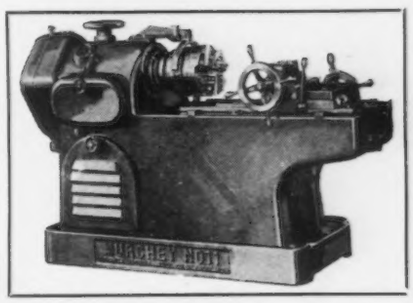
Replying, Mr. Leisure said that the complaint is divided into two separate causes for action. The first cause of action, he said, is bottomed on a charge of collusion, because as recently as 1925, the Supreme Court had occasion to pass upon all of these alleged practices in the first cause and in the absence of a charge of collusion did not condemn them. The charge of collusion, therefore, is necessary in the cement case, Mr. Leisure said, to support a prima facie case.

Referring to the fact that Governmental agencies have widely publicized identical bids as evidence of collusion, Mr. Leisure said it is inconceivable that an industry which has been before the Department of Justice as recently as 1925 would submit to their prosecutors evidence of collusion in the form of identical bids if they were arrived at as the result of collusion. He said he believed the facts will show that rather than being evidence of collusion the identical bids will prove to be the best evidence that the cement industry is a highly competitive industry, dealing in a standard product, so that prices tend to be uniform whether to the United States Government or to the individual.

Copies Government

Turning to the Government criticism that bids are not only identical but are made to the fourth and fifth decimal point, Mr. Leisure neatly turned to the policy of the Government itself in taking advantage of land grant

QUALITY THREADS
With
Production Speeds



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Two sizes of machines, No. 11 and No. 22, cover the range of machine threads from 1/4" to 2 1/2" and pipe threads 1/8" to 2". Machines are equipped to use tangential chasers.

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Collapsible Taps, Self Opening Die Heads; Bolt Threading, Pipe Threading and Pipe Cutting Off Machinery.

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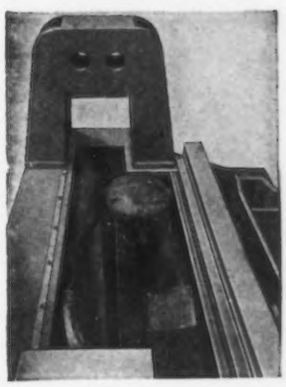
SCRAP BALERS



STYLE
100 TC
(100 x 51 x 36)
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Also Regular
Double Ram Presses
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COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES AND PUMPS

railroad rates, which are figured down to the third, fourth and fifth decimal point.

"So that any shipper, if his mathematics is not bad, in using the Government machinery, must get at the fourth and fifth decimal point, and if meeting a destination price, the fourth and fifth decimal point will certainly be arrived at in any bid that is made to the United States Government on a land grant railroad," said Mr. Leisure.

Speaking of the complaint against the delivered price or so-called basing point system, Mr. Leisure said that it is not a charge against the basing point system itself "but it is more an attack on the delivered price and destination system used in this country." There, too, he said, the evidence must be bottomed on collusion, "because there, too, the Supreme Court has as recently as 1925 passed upon this issue and in the absence of an allegation of collusion, did not condemn it."

He said that the method had not been arrived at by "sitting down around the table and fixing prices as has been suggested, but has been the result of purchasers wanting to know the price of the product where they receive it."

Industry, he said, must quote as the purchaser wants it. Moreover, Mr. Leisure said that if a manufacturer wants to extend his market to "foreign fields" he can do so only by quoting the competitive price where the selling is to take place. This practice, it was insisted, had been arrived at, as the Supreme Court found in 1925, "as the result of the natural historical development of a business enterprise dealing in standard products."

Favoritism Opposed

As to trucking, Mr. Leisure said the cement industry is opposed to selling to trucks cheaper "than we sell to someone else." He said that if the industry has established dealers who must be dealt with throughout the year and they purchase by railroad the industry must keep them alive or go out of business. Concluding, Mr. Leisure said:

"The second cause of action as to the discrimination in prices, that cause of action, as I read it, is principally a charge of discrimination of purchase or sales price within Section 2 of the Clayton Act as amended by the Robinson-Patman Act. But to me, that presents more a conflict of two economic theories rather than any disagreement of facts. It is the theory of the Government, as I read the complaint, that true price and the actual price, and incidentally I have studied the Robinson-Patman Act with some care and I have not found any distinction made by the Congress in what the Government calls "true price" and "actual price," and in sales price and purchaser's price as used by the Act.

Which Is True Price?

"It is the theory of the Government, as I read the complaint, that true price or actual price is mill price, while, on the other hand, it is our theory and it will be our contention throughout this case, that sales price means where the sale is made, what the purchaser pays for it, and I may say that our theory is entirely substantiated by the National Sales Act as to where price is fixed.

"But, however, it may finally be determined . . . as to these two economic theories, one thing I am entirely clear on, and that is that the law governing these two theories is well established, and that whether you call what a person pays for his goods, price, or whether you call it wampun, or whatever you call it, there can be no discrimination of price so long as all purchasers are treated the same; and that we expect to demonstrate . . . that this industry has done the same with private purchasers as with the United States Government."

NLRB Tries To Seize Records In Article On Weirton Steel

WASHINGTON, Dec. 7. — The National Labor Relations Board, irked by an article published in *Mill and Factory* which labeled the NLRB-Weirton Steel hearings as "a colossal burlesque staged with taxpayers' money," has been thrown for a loss in its initial attempt to subpoena the editor and records of the publication.

Elisha Hanson, counsel for the Conover-Mast Corp., publishers, told the board in an open letter that its action was in violation of the constitutional guarantee of a free press, and that he had advised Hartley W. Barclay, the editor, that he is under no obligation to appear before a NLRB examiner.

In fact, the publishers "are obligated by the very nature of their business not to appear," Hanson told the board. He added:

"For any agency of the Government to assert the power to compel the production of information concerning the processes by which information is gathered, formulated, edited, and published is to assert a power to restrain the processes of the press in a manner repugnant to the Constitution of the United States. That is exactly what the NLRB has done by issuing this subpoena."

Board Defends Self

The board, always adept at rising to the defense of its far-flung dynasty, aroused speculation immediately as to whether it was moving to control the press. Despite a barrage of editorial criticism, it did not back down on its original threat to subpoena the publisher's records, including proofs and layouts of the article. Instead, it announced plans to call upon the Federal courts to uphold its authority if necessary.

The story which roused the ire of the board was entitled "The True Story of Weirton," and was severely critical of NLRB representatives and reiterated the charge heard repeatedly that they were prejudiced in favor of the CIO. It said, among other things:

"There is tragedy in the fact that many townspeople fear the activities of the NLRB combination with CIO so greatly that they compare it to the celebrated OGPU and will not discuss their opinions openly in public for fear of being overheard and subjected to reprisals.

"There is tragedy when factory workers who can afford to spend money for luxuries out of wages ranging from $5 minimum to $53 maximum per day hoard their cash in fear of a shut-down due to expected disorder which they believe will result from the activities of the NLRB-CIO combination."

The NLRB subpoena directed the editor to appear before a trial

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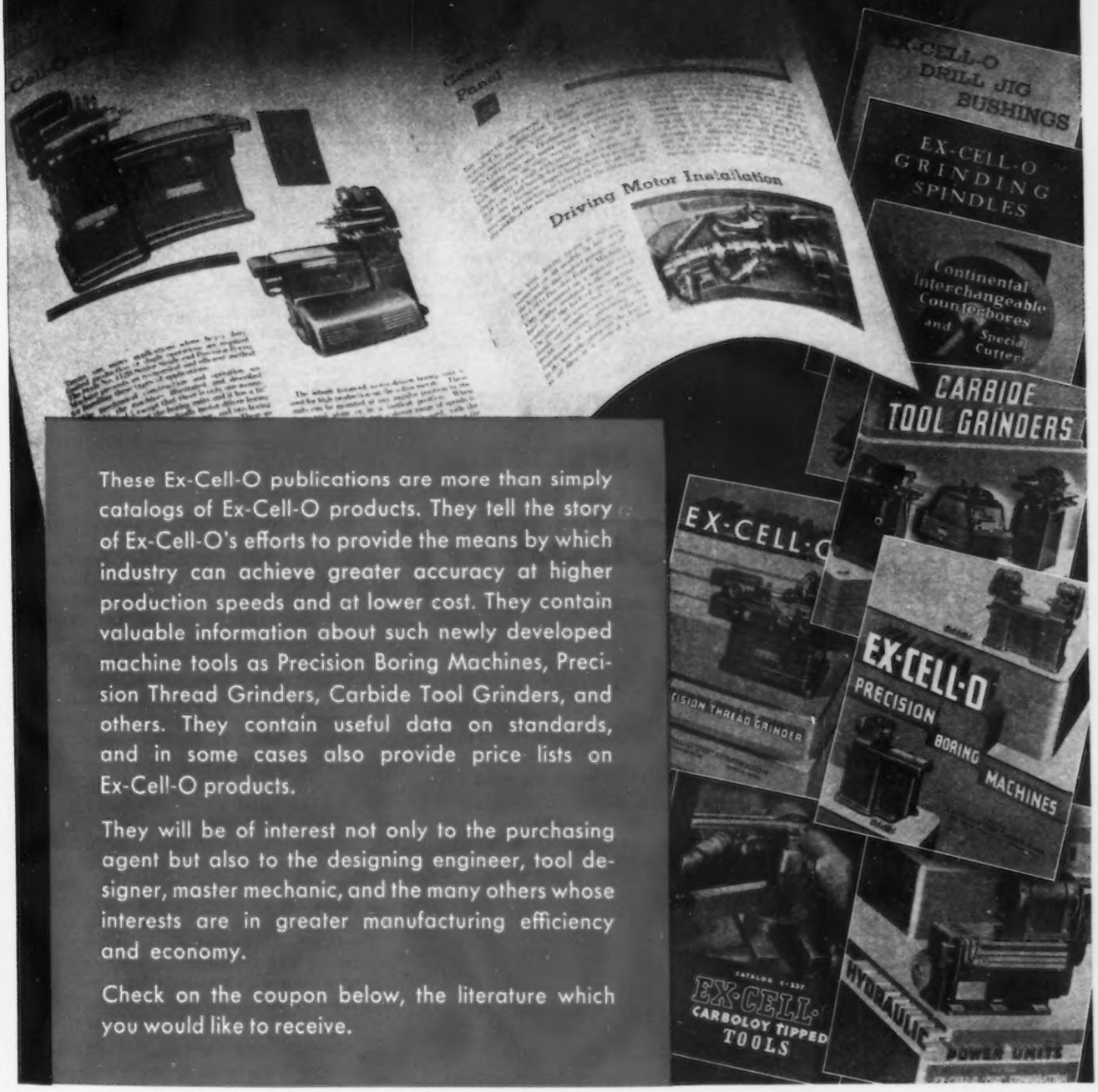

These Ex-Cell-O publications are more than simply catalogs of Ex-Cell-O products. They tell the story of Ex-Cell-O's efforts to provide the means by which industry can achieve greater accuracy at higher production speeds and at lower cost. They contain valuable information about such newly developed machine tools as Precision Boring Machines, Precision Thread Grinders, Carbide Tool Grinders, and others. They contain useful data on standards, and in some cases also provide price lists on Ex-Cell-O products.

They will be of interest not only to the purchasing agent but also to the designing engineer, tool designer, master mechanic, and the many others whose interests are in greater manufacturing efficiency and economy.

Check on the coupon below, the literature which you would like to receive.

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examiner in Steubenville, Ohio, on Dec. 6 with any communications exchanged between the publisher and the Weirton Steel Co. and all other material used in preparing the story.

Must Refuse Such Demands

"Publishers and editors who are true to their trust," Hanson informed the board in explaining his position, "must refuse to comply with any demand of any Government agency for them to lay bare not only the sources of their information, but the record of their work, the inner workings of their minds, and the reasons controlling either their news or editorial policy."

Meanwhile, the Senate Civil Liberties Committee, which has also been criticized as another OGPU organization in Washington, announced its intentions of examing records of Hill & Knowlton, of Cleveland, public relations counsel for the Republic Steel Corp., and the Youngstown Sheet & Tube Co. Committee aides explained that the material was desired in connection with their study of employer organizations when hearings are resumed in January.

Explaining the action of the Labor Board in issuing the subpoena against the publication, NLRB spokesmen charged that the Weirton Steel Co. had circulated the article among its workers and that, in the opinion of the board, is an "unfair labor practice" in violation of the Wagner law.

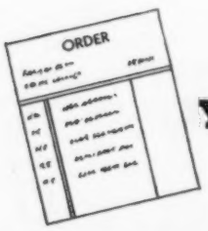
"When any such material is circulated among employees by an employer as an instrument of coercion against free organization, however, the action falls within the category of unfair labor practices," the spokesman said.

Calls Practice Unfair

"Mr. Barclay may print and publish anything he wants to in any way, but if the Weirton Steel Co. uses such material as an instrument for discouraging unionization, there is an unfair labor practice."

The board feels, it was said, that the material asked for is essential in compiling information in connection with the Weirton case which is still pending. The spokesman added:

"The board has never at any time attempted to take punitive action against the writing or publishing of material critical of the board. Its present action is not based upon this circumstance."



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Starrett makes three kinds of hacksaws—Tungsten Alloy, High Speed Steel and S-M Molybdenum.

Starrett makes all three in a complete range of sizes for hand frames and power machines.

In other words, no matter what kind, type or size hacksaw you prefer, Starrett makes it and your distributor is almost certain to carry it in stock. Refer to Revised Starrett Catalog No. 25AA when you want the one best hacksaw for any metal cutting job. Write for a copy.

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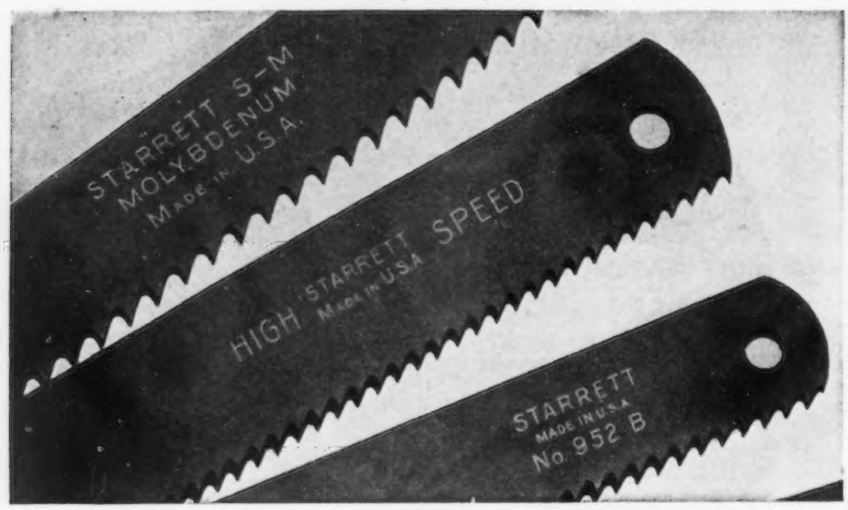
World's Greatest Toolmakers—Manufacturers of Hacksaws Unexcelled—Steel Tapes, Standard for Accuracy Dial Indicators for Every Requirement



BUY THROUGH YOUR DISTRIBUTOR

Business Tax Drives Companies from Washington

WASHINGTON, Dec. 7.—The District of Columbia's business privilege tax law, enacted in the closing rush of the last Congressional session, has resulted in at least two concerns closing their Washington offices, one of which is the Youngstown Sheet & Tube Co., according to officials of the Washington Board of Trade.

The tax, which is due to expire June 30, is levied at the rate of 2/5 of 1 per cent on gross receipts in excess of $2,000 during 1936 and is applicable to all concerns in the district engaged for profit. Even out-of-town firms which do not maintain an office here are subject in some instances to the gross receipts tax. In any event, a license fee of $10 is required of any firm or group which solicits business in the city irrespective of whether its income is below the $2,000 figure.

Local and outside business groups have been up in arms over the law ever since its enactment but because of its temporary nature few have considered it worthwhile to test its validity in the courts. There is little likelihood of its re-enactment, according to opponents of the law who insist that Washington, governed by the Congress and not by a representative municipal government, is the only place in the country where such a measure could ever find its way to the statute books.

Industry Needs Education, Team Play, E. R. Stettinius, Jr., Declares

WHATEVER industry does to lift the mental stature of employees is bound to help industry itself, Edward R. Stettinius, Jr., said in a radio address prepared to be delivered Dec. 7 from New York.

"A corporation's effectiveness can never be greater than the sum total of the abilities of its men and women," Mr. Stettinius, chairman-elect of United States Steel Corp., explained.

Mr. Stettinius' talk, one in a United States Department of Commerce radio series on "Stories of American Industry," emphasized importance of education for all classes of workers.

"We in industry have an educational duty also toward every person in the enterprise," he said. "We are doing more along these lines than is generally realized, but the work must be carried further. Job training is now common. The object is not only to teach a man how to do his job well and increase his earning power, but also to grasp the industrial procedure of which he is a part, that he may see enlarged opportunity for his personal advancement.

"An industrial operation is not a series of individual efforts but a mighty achievement in team play," Mr. Stettinius said. "Industry is ever in need of talent, training and vision. Inside the shop industry is striving more and more to provide educational opportunity. Outside the shop industry supports all efforts to lift America to higher mental and cultural levels."

Editors Visit New G-E Plastics Plant

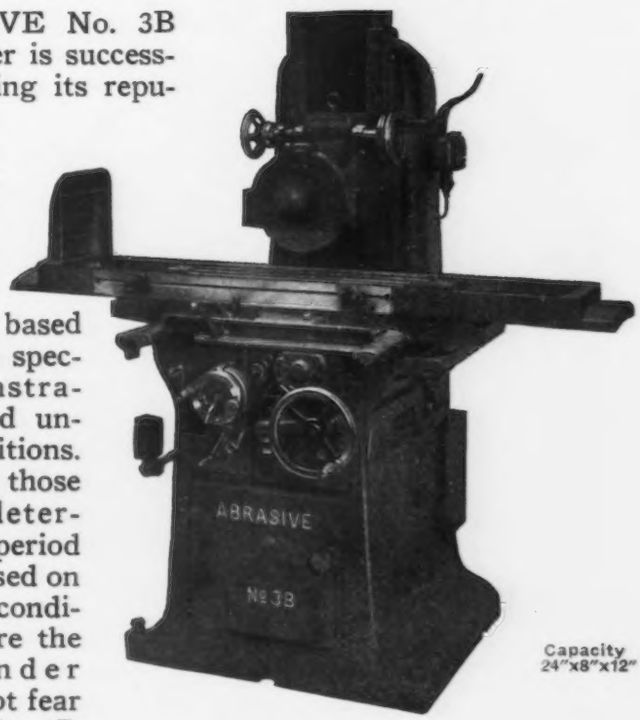
EDITORS of a number of trade and business publications were guests of the General Electric Co., Dec. 2 and 3, on an inspection trip through the company's new plastics plant at Pittsfield, Mass.

This new plant, devoted mainly to hot molding of Textolite phenolic materials, is a considerable expansion of the company's former Pittsfield plastics department, and its equipment and layout are planned to meet a marked increase in the demand for molded plastics. This demand increase is said to have been threefold or more in the past five years. The plant is located on a site of 22 acres, with floor space of more than 110,000 sq. ft. now occupied. Employees at present number 900. The plastics departments for the manufacture of laminated materials, cold molded products, etc., has branch plants located at Lynn, Mass., Meriden, Conn., and Fort Wayne, Ind.

Speakers at a luncheon meeting held Dec. 2 in the ballroom of the Wendell Hotel, Pittsfield, included G. H. Shill, general manager of the plastics department; H. M. Richardson, chief engineer; and K. W. Nelson, manager of sales. A dinner meeting the same evening featured addresses by E. O. Shreve, vice-president in charge of sales and chairman of the G-E plastics advisory committee, and C. H. Lang, director of advertising, Schenectady. N. S. Stoddard, advertising manager, Pittsfield, Mass., was toastmaster at the luncheon, and Mr. Nelson at the dinner. The editors inspected the new molding plant on the afternoon of Dec. 2, and the resin plant and the laboratories, where the G-E Textolite compounds are developed, manufactured and controlled, on the morning of Dec. 3. Further details of the new Pittsfield plastics plant will be included in a forthcoming issue.

There Is No Substitute for Economical Production

The ABRASIVE No. 3B Surface Grinder is successfully maintaining its reputation for low-cost, high quality production in the face of keen competition.



Capacity 24"x8"x12"

Costs are not based on one or two spectacular demonstrations conducted under ideal conditions. Real costs are those which are determined over a period of time, and based on actual shop conditions. These are the conditions under which we do not fear to place the No. 3B.

To our minds, the cost of removing stock to close tolerances is still the controlling factor in the purchase of Surface Grinders.

ABRASIVE MACHINE TOOL COMPANY

EAST PROVIDENCE, R. I.

..PERSONALS..

JOHN F. MACENULTY has been elected president and a director of the Pressed Steel Car Co., Inc., Pittsburgh. He was vice-president and director of the old Pressed Steel Car Co., and since the reorganization has been vice-president in charge of sales, with offices in New York. GEORGE H. FLEMING, vice-president, has been elected executive vice-president.

JOHN O'H. ANDERSON has been appointed assistant district sales manager in the New York office of Jones & Laughlin Steel Corp., Pittsburgh. Mr. Anderson entered the employ of Jones & Laughlin in 1924 in the production department of the Pittsburgh works. In 1926 he became connected with sales work and was engaged in that type of work in Pittsburgh, Washington, Buffalo and Houston until Feb. 1, 1937, when he was assigned to the New York district sales office.

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ERNEST P. WAUD, who has been vice-president of the Griffin Wheel Co., Chicago, since 1919, has been elected president of the company, succeeding FRANK L. WHITCOMB, who has been made vice-chairman of the board. Mr. Waud received his formal schooling at St. Paul's School and at Cornell University, entering the employ of the Griffin company in 1905 as inspector of chilled railroad car wheels. He was later appointed chief inspector, department manager, assistant treasurer, and in 1919 vice-president.

J. F. MacENULTY

JOHN O'H. ANDERSON

CARL M. RIEFKIN, formerly assistant purchasing agent and advertising manager of the Newport Rolling Mill Co., Newport, Ky., has been promoted to the post of assistant general sales manager.

ROBERT G. GUTHRIE, past-president of the American Society for Metals and consulting metallurgist for the Peoples Gas Light & Coke Co., Chicago, has been reappointed chairman of the ferrous metals committee of the Industrial Gas Section, American Gas Association. RALPH D. HAWKINS, of the Bridgeport Gas Light Co., Bridge-

TO GIVE PRECISION

Timken zero precision mirror finish roller bearings — dynamic balance of every rotating part — accurate gauging and inspection

TO KEEP PRECISION

Maximum slide areas — sturdy construction — three point bed mounting — perfection in material and workmanship

RIVETT LATHE & GRINDER INC.
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PIONEERS IN BENCH LATHE DEVELOPMENT

you get them all

WHEN YOU INSTALL A

NATCO B-225H DRILLER

- RAPID DRILLING
- EASE OF OPERATION
- DEPENDABILITY
- MINIMUM MAINTENANCE

When you install a NATCO B225H Driller you install a versatile machine which provides all these worth-while advantages.

Rapid Drilling. This machine is provided with a hydraulic feed with pressure enough to push medium sized drills at a high penetration rate. The feeding rate may be changed as desired thru the use of a single valve.

Ease of Operation. Two operating levers are within easy reach of the operator. One lever is used for routine operation of the machine while the other provides an emergency reverse. In addition the second lever may be used for jogging the head for set-up purposes. All unnatural movements on the part of the operator have been eliminated, thus providing easy and positive operation.

Dependability. Several hundred machines of this type, arranged with various sized heads are in operation throughout the world. Many plants have standardized on this type of driller for all their medium sized work.

Minimum Maintenance. The NATCO B225H driller is of simple, efficient and sturdy design . . . making possible its normal operation over long periods with a minimum of maintenance.

The machine shown may not fit your particular needs . . . yet among the many types and sizes there is one, when properly applied to your needs, that will lower your drilling costs. Why not call a NATCO representative and let him aid you in coming to a practical and profitable solution to your "hole" problems?

Chicago Office—2009 Engineering Bldg.
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Investigate NATCO Methods for Lower Production Costs!

THE NATIONAL AUTOMATIC TOOL CO.
Richmond, Indiana, U.S.A.

NATCO

Drilling, Boring and Tapping Machines

port, has been made chairman of the non-ferrous committee.

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H. J. GEORGEN has been added to the sales staff of the Michiana Products Corp., Michigan City, Ind. Mr. Georgen, who has had 15 years of experience in the field of heat resistant and stainless steel alloy castings, will make his headquarters at 80 East Jackson Boulevard, Chicago.

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GEORGE HOWARD RITCHIE, since September, 1930, chief engineer of the transportation department of the Tennessee Coal, Iron & Railroad Co., Birmingham, has been promoted to the post of general superintendent of that department, succeeding HENRY J. WURTELE, who has joined the Birmingham Southern Railroad Co. as vice-president. Mr. Ritchie joined the Tennessee company as a draftsman in 1910. He left the service of the company for a year, returning in 1912 as assistant chief engineer of the Birmingham Southern Railroad and the Tennessee Coal, Iron & Railroad Co. transportation department, of which he was made chief engineer in 1930.

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CARY D. TERRELL, vice-president, with offices in Chicago, of the American Car & Foundry Co., New York, has resigned because of ill-health, effective Jan. 1. He has served the company for nearly 30 years, having joined the company in 1910 at the St. Louis plant. Seven years later he was sent to Washington to supervise work being done for the Government during the World War. Leaving Washington in 1919, he was transferred to the Chicago office as sales agent and in 1922 was made assistant vice-president in charge of sales in the Chicago district. He has been vice-president for the past 10 years.

J. H. VAN MOSS, who has been assistant vice-president of the company since December, 1936, has been appointed Western sales manager, with headquarters in Chicago. He has been identified with the railroad field since 1918, when he started as Eastern sales representative for the Pennsylvania Tank Car Co. and the Pennsylvania Tank Line, of which he was later made vice-president. Subsequently he was elected to the presidency of the Pennsylvania Tank Car Co., and became identified in 1927 with the Shippers Car Line Corp., subsidiary of the American Car & Foundry Co. He became identified with the parent company in October, 1934, as sales agent, and was appointed assistant vice-president in 1936.

W. P. MCBRIDE, who has been associated with the Chicago office of the company since 1923, has been made assistant Western sales manager. He is a son of the late W. J. McBride, who was for many years vice-president and general manager of the company.

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MILTON LEVENSON, of the Roxbury Iron & Metal Co., Inc., Dorchester, Mass., has been made president of the Boston chapter of the Institute of Scrap Iron and Steel.

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STANLEY M. HUNTER, who has been associated with the American Hoist & Derrick Co., St. Paul, Minn., for the past two years, has been appointed manager of sales.

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DEXTER NORTH, until recently chief of the Chemical Division of the United States Tariff Commission, has joined the staff of Arthur D. Little, Inc., Boston, as Washington technical representative.

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CHARLES G. KESHEN has become affiliated with the Boston office of the Gates Rubber Co., Denver, as a sales engineer in the industrial division. He was formerly connected with the Gifford-Wood Co., Hudson, N. Y., and with the Boston Gear Works, Inc.

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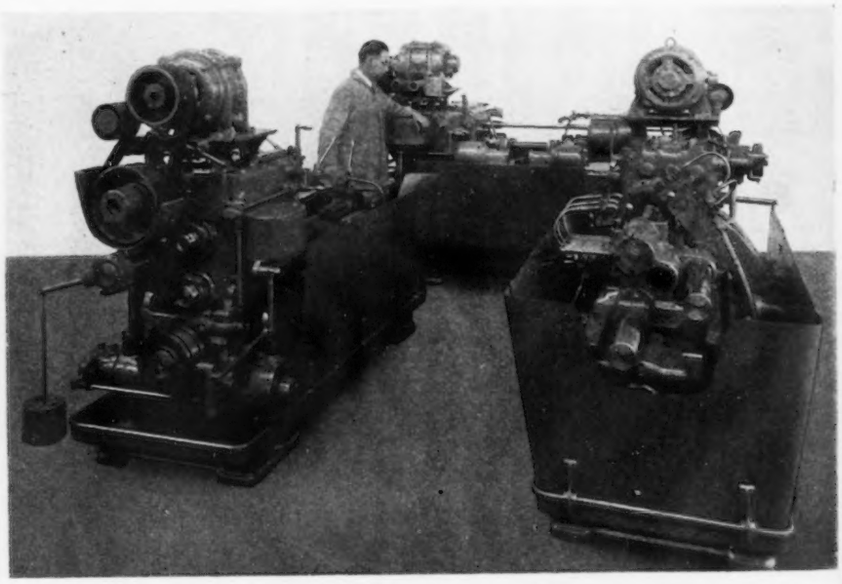
B. B. MORTON, a member of the development and research division



SAVE ONE-HALF

WITH THE J & L AUTOMATIC DOUBLE END MILLING AND CENTERING MACHINE

In one automatic cycle, the J&L Automatic Double End Milling and Centering Machine mills bars to length and centers them to uniform depth. This one machine replaces the duplex mill and the double end centering machine, and, when used with a pair of turning machines, one operator can run all three machines. Consider the saving in upkeep, initial investment, floor space, and labor offered by this one machine.

An automobile manufacturer is getting outstanding production with his J&L Milling and Centering Machine. One-eighth inch of stock is removed at each end of a bar 1¼ inches in diameter. The bar is then centered at both ends. A floor to floor time of 17 seconds is obtained. This is an average production of 1300 pieces per eight hour day.

This machine may be used to advantage on small lots or mass production. May we estimate the profits available to you on a similar job?

JONES AND LAMSON MACHINE COMPANY

Springfield, Vermont, U. S. A.

of the International Nickel Co., Inc., New York, was scheduled as the principal speaker at the meeting of the Bradford Group, Department of Standards and Tests, National Petroleum Association, Nov. 6, at Wellsville, N. Y.

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A. A. NELSON, who has had extensive experience in the materials handling line, has joined the sales force of the Robins Conveying Belt Co., New York.

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GEORGE H. CARDEN has been placed in charge of the newly opened Syracuse, N. Y., office of the Allis-Chalmers Mfg. Co., Milwaukee. The office will operate as a branch of the company's Buffalo district office, of which H. E. WEISS is manager.

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WALTER A. HOPPE, who has had 17 years of experience in the power transmission equipment field, has been appointed representative in southern California for the Foote Brothers Gear & Machine Corp., Chicago.

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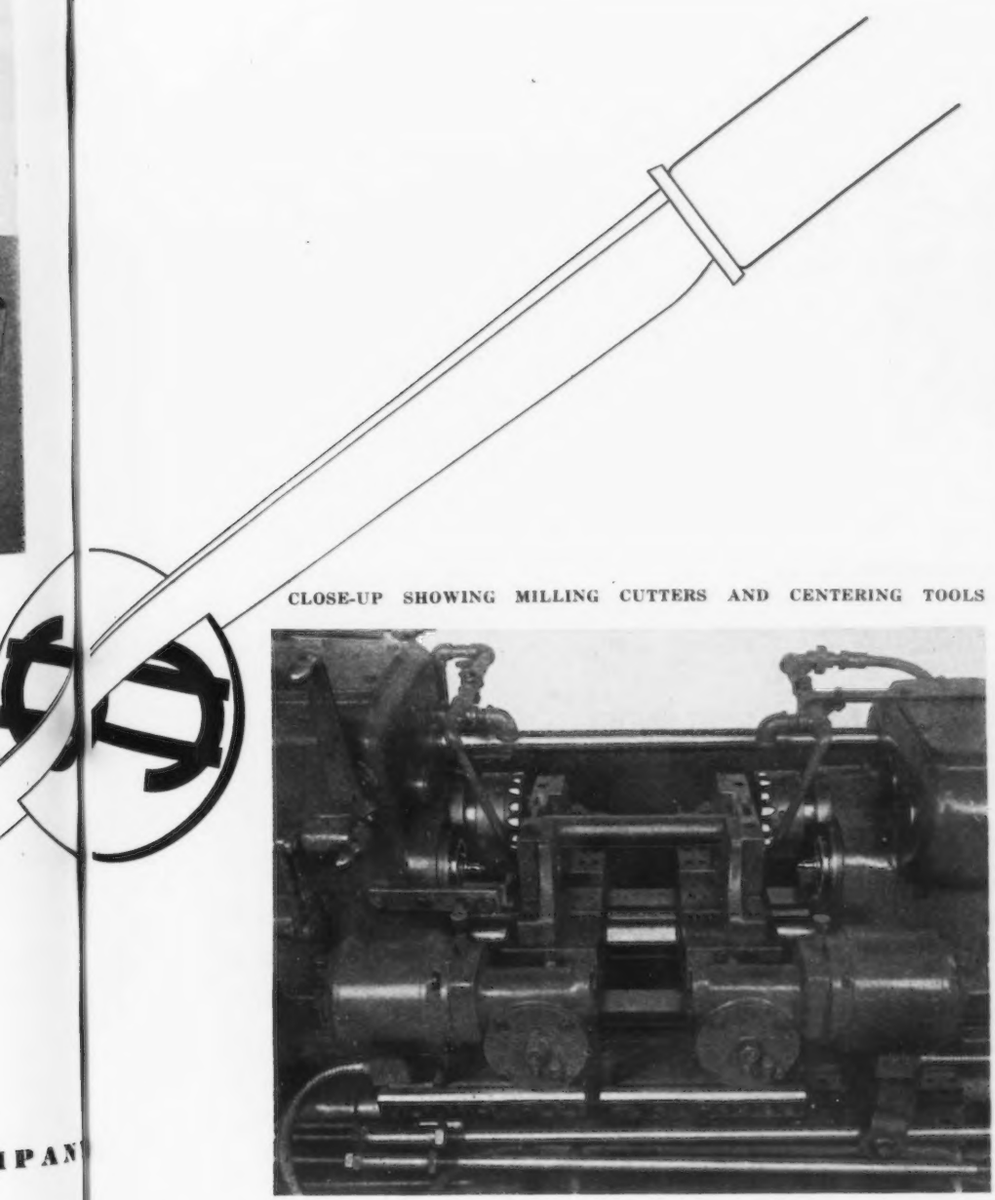
P. E. MCKINNEY, metallurgical engineer, for the Bethlehem Steel Co., Bethlehem, Pa., will discuss steel castings at the meeting of the Philadelphia chapter of the American Foundrymen's Association, Dec. 10, at the Engineers Club.



CLOSE-UP SHOWING MILLING CUTTERS AND CENTERING TOOLS

AFL Bargainer In Osgood Co. Plant

WASHINGTON, Dec. 7. — The AFL's International Association of Machinists has been certified by the NLRB as the exclusive collective bargaining group for hourly production workers of the Osgood Co., Marion, Ohio, manufacturer of power shovels, road rollers and excavating machinery, and jobber of iron and steel castings.

The AFL union had charged that the company refused to bargain collectively before the Labor Board which held a public hearing Sept. 23 at which time membership cards convinced the board that the union's claims were accurate. Board findings showed that the AFL union was the only labor organization in the plant.

113 Old Cargo Ships Are Withdrawn From Sale

WASHINGTON, Dec. 7.—In an attempt to stimulate new ship construction, the Maritime Commission has withdrawn from the market 113 remaining cargo vessels of its obsolete fleet built during the War.

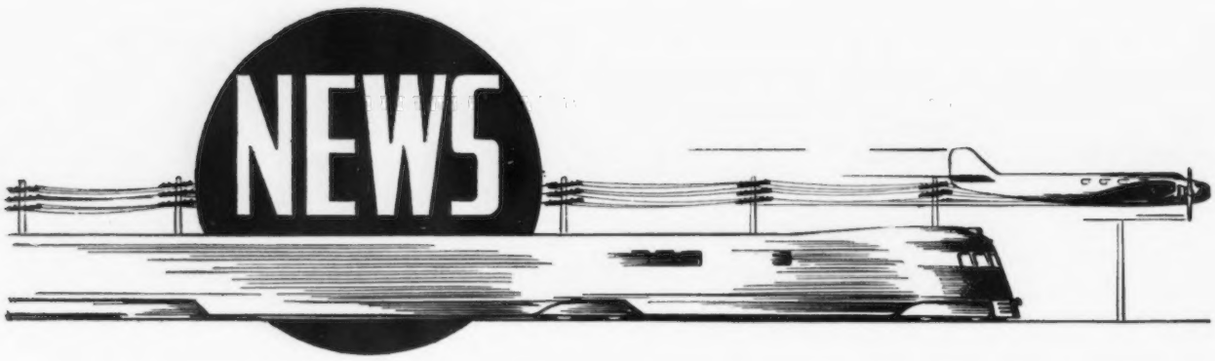
Chairman Kennedy said that recent inspection showed they still had sufficient value to warrant preservation for emergency purposes despite their age and protracted idleness.

"This action," he said, "will remove one serious obstacle to the building of modern fast vessels by private ship operators. . . ."

Officials explained that the two 8000-ton cargo vessels of the Commission's laid-up fleet at Seattle, Wash., on which bids for scrapping were recently rejected, will probably be readvertised in an effort to obtain higher bids.

Ferroalloy Prices Are Reaffirmed

A LEADING maker of ferroalloys has reaffirmed present base prices on carload quantities of ferromanganese, ferrosilicon, ferrochrome, silico manganese and other alloys for the first quarter. There have been minor revisions of prices on less-carload lots of ferrosilicon, ferrochrome and silico manganese and on various types of packages.



Rail Rate Increase Would Give Jobs, Lift Buying, Officials Promise

WASHINGTON, Dec. 7. — Greater revenues will result in increased employment and purchases by the railroads, E. E. Norris, president of the Southern Railway System, this week told the Interstate Commerce Commission, at hearings on the carriers' application for increased rates.

"If I, for instance, could confidently anticipate prompt and favorable action on the application before you," Mr. Norris said, "I would happily go back to my office and, instead of laying off more men and discontinuing every purchase that safely can be deferred, I would recall many hundreds of laid-off men and start buying some of the many millions of dollars worth of equipment, material and supplies that we need.

"I think it is a fair assumption that other rail managers would do likewise and I know of no better way to arrest the present recession and again start the business spiral upward, for the old iron horse has a ravenous appetite.

Opponents Lift Prices

"Here we are from all over the country engaged in a hearing on the proposition of how we shall meet our increased costs of doing business—and our increased costs must be perfectly obvious to every one. I venture to say that those who are here to argue against our application for increased rates, or rather a restoration of former rate levels, have, without a single exception, increased the sales price of their products in recent months for the very same reasons that we in the railroad business are urging upon the commission in our request for advanced rates, namely, increased costs of all materials, increased wages and increased taxes."

In the six years and 10 months ending with October, 1937, the Lehigh Valley Railroad has incurred a deficit in net income amounting to $12,270,000, according to D. J. Kerr, president of that railroad.

Needs New Locomotives

"A great effort," said Mr. Kerr, "has been made to eliminate all property not needed for the present operation of the railroad, for the dual purpose of reducing maintenance and of obtaining the benefit of materials recovered.

"Retirement of equipment since 1930 has included more than 200 locomotives, 10,000 freight cars,

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★ "LEVEL OFF" *Unusual* JOBS WITH *Standard* ELWELL-PARKERS

Warehousing automobiles cased for export—tiering them high with Elwell-Parkers in order to obtain greatest use of floor space and most profitable return from air rights—offers a worthwhile, challenging job of money-saving to automotive manufacturers and transportation companies.

Challenging to you too—because *whatever* the size, weight, bulk of the materials you transport through the 7 STEPS OF PRODUCTION,* you must keep costs down at *every* stage—not merely at shipping.

You probably will be agreeably surprised to learn how far you can go in "leveling off" load-transportation jobs that may seem peculiar to your industry or even to your own plant, by applying Elwell-Parker Power Industrial Trucks, Tractors and Cranes of *standard design.* The reasonable first cost is quickly amortized—thereafter the machines earn steady profits for you, for many years.

Profit by Elwell-Parker's years of successful experience and constant progress in building Power Industrial Trucks. A Representative near you knows which of the many types of Elwell-Parker Trucks, Tractors and Cranes will best serve your needs. Call him in—*now.* The Elwell-Parker Electric Company, 4225 St. Clair Ave., Cleveland, Ohio.

* *Movements in Your Plant:*—
1—Car to Receiving
2—Receiving to Raw Stores
3—Raw Stores to Processing
4—Through Processing
5—Processing to Finished Stores
6—Finished Stores to Packing
7—Packing to Car or Motor Truck.

New Type **ELWELL·PARKER** *Trucks*

ESTABLISHED 1893 • BUILDING POWER INDUSTRIAL TRUCKS SINCE 1906

and nearly 200 passenger cars. The aggregate retirement has amounted to $26,400,000, while additions to equipment have been approximately $14,300,000.

"The Lehigh Valley Railroad now needs 25 new air-conditioned coaches, 1500 open-top freight cars, 1000 box cars, and 100 cabooses. The cost of this equipment would be approximately $7,800,000. Also, the company could make good use of additional locomotives.

"It is impossible under present conditions to give any consideration to these requirements. Furthermore, many improvements are needed in fixed property. The present maintenance program necessarily will have to be increased in the next few years. Bridges need to be rebuilt and strengthened; many new tools are needed for shops; and improved power plants and roundhouses are required at intermediate points. Under present conditions, no program can be made, and only necessary improvements can be carried out. The entire property is being maintained only to the extent necessary to make it safe. Higher revenues constitute the only way in which adequate maintenance may be carried out in the future."

Case Being Expedited

With testimony of railroad executives ended last week, the carriers' case was closed today with testimony by railroad traffic representatives, to be followed by shippers' testimony and final hearing in Washington on Feb. 7. Oral arguments then will be made and the case submitted. The procedure has been taken to indicate that the ICC is expediting the case.

Shippers, if ready, will be heard here tomorrow, after which regional hearings will be held as follows: Atlanta, Jan. 10-14; Los Angeles, Commissioner Aitchison, Jan. 11; Portland, Ore., Commissioner Porter, Jan. 11-15; Salt Lake City, Commissioners Aitchison and Porter, Jan. 17-22; New Orleans, Commissioner Caskie, Jan. 17-21; Washington, Commissioner Caskie, Jan. 24; Chicago, Division 7 (Commissioners Aitchison, Porter and Caskie), Jan. 25.

The Pullman Co. application for a 10 per cent rate increase will also be heard at the regional proceedings and the final hearing in Washington.

The ICC last week granted to railroads west of the Mississippi River and Lake Michigan increases in passenger fares which, it is estimated, will yield approximately $2,500,000 annually.

Steel Cartel Reaches Agreement With United States Exporters

LONDON *(Special Correspondence)*.—It was expected that several far-reaching decisions would be made at the Paris meeting of the European Steel Cartel, held on Nov. 22 and 23, and the meeting was regarded as being of especial importance due to the fact that representatives of the United States steel industry were present.

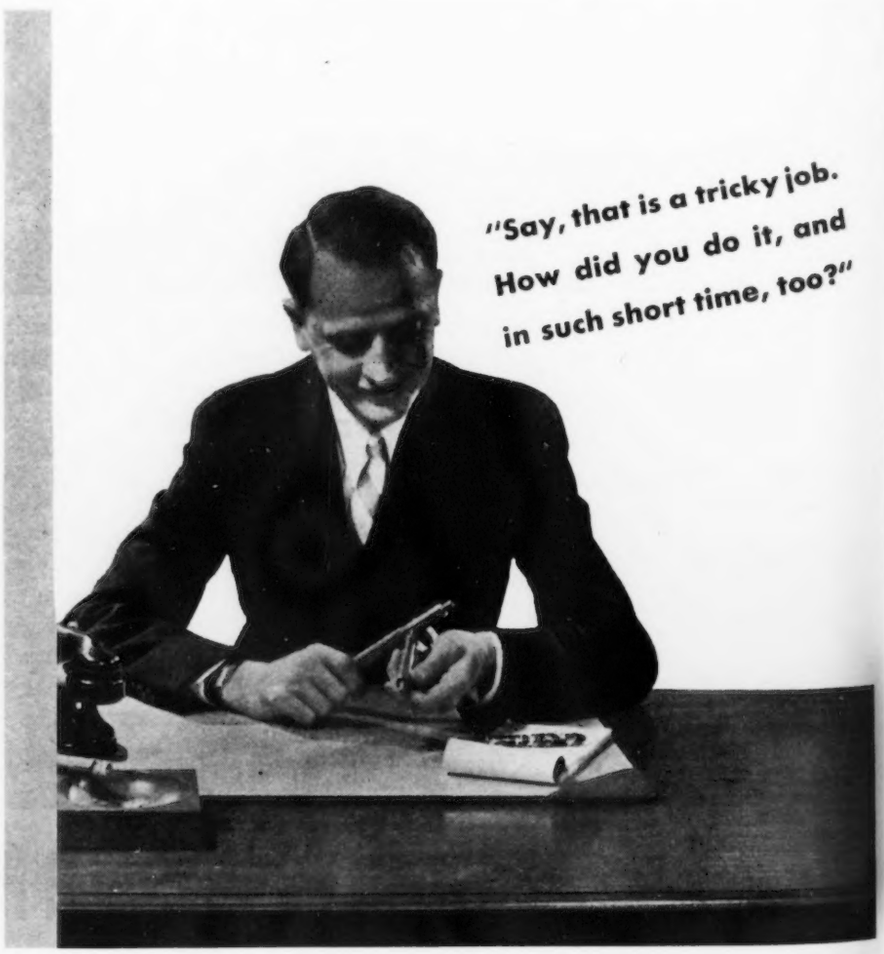
On occasions during the past two years there have been reports that the American steel industry intended to ally itself to the cartel, but so far these have not been substantiated. Matters, however, appear to have been carried a stage further and there were expectations that America would finally decide to take this step at the Paris meeting. Such action would greatly extend the degree of control exercised in the steel industry of the world.

So far, however, no official announcement has been made concerning the cartel's deliberations and the most reliable news comes from the Agence Economique et Financiere at Luxemburg, which declares that steel prices will be maintained at their former level following the arrangements made with American exporters.

Luxemburg circles appear satisfied with these agreements. Details have still to be settled, but the agreements will presumably contribute substantially to the recovery and stability of the market.

British Needs Still Large

It is understood that agreement was reached between the cartel and American exporters regarding supplementary supplies of semi-finished products for the United Kingdom during the first three months of 1938, thus indicating that British needs remain greater than cartel members can handle.



It is added that these new orders will be a considerable support for the Belgo-Luxemburg metallurgical industry and will help to counteract the slackening of activity that has occurred recently.

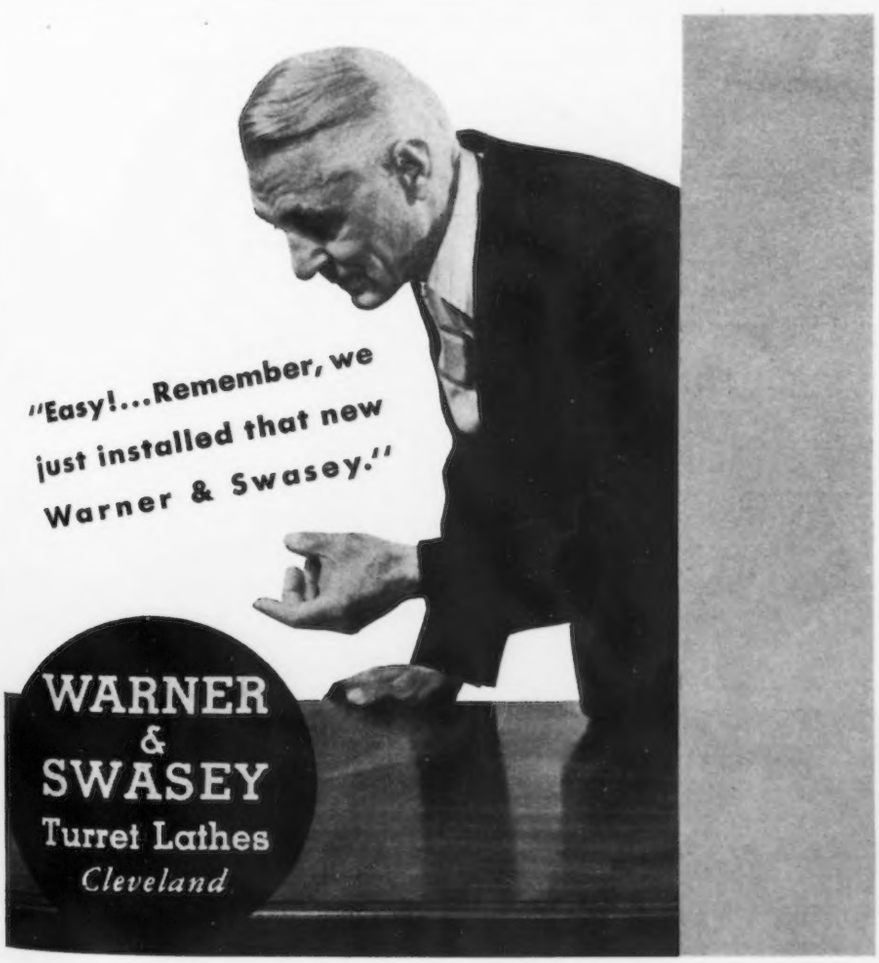
Will American Steel Manufacturers Become a Member?

The London *Financial Times* goes further than the Agence Economique and asserts that American steel manufacturers will become actual members of the cartel in the near future if discussions now under way are successfully concluded. With the exception of strip, hoops and sheets, asserts this paper, there is good ground for believing that agreement will be reached on the terms of United States participation in the cartel. Such participation, by insuring American manufacturers a specific export quota, would enable more effective regulation of price policy in world markets.

On the other hand, other authorities discredit the suggestion that the United States will become a member of the cartel. In any case, it is believed that the agreements reached will bring an end to price cutting.

Price Policy Paramount

The question of price policy loomed large in the Paris deliberations, and it is understood that the quotations for practically all descriptions of steel controlled by the cartel were reviewed. As stated earlier, no changes in export prices were announced, and apparently the official British and Continental rates for structural material, including bars and plates, will remain unaltered for export pending further consideration of the situation. The exception to this is shipbuilding steel for some of the Northern markets, for which the price has been adjusted to meet local conditions from £14 to £12 ($70 to $60). This decision to adhere to current prices will no doubt cause some surprise, as drastic alterations had been predicted. It is evident, however, that the American agreement has had a lot to do with the maintenance of prices. Without that agreement, price cuts would have been more likely.



...OBITUARY...

STANLEY T. SCOFIELD, assistant to vice president of the United States Steel Corp., died in a Chicago hospital Nov. 30, aged 51 years. He had been in poor health for several months. Mr. Scofield was born in Buckhorn Furnace, Ohio, and was graduated from Ohio State University in 1905. He was engaged for some time in advertising work, specializing in industrial and financial accounts. He served as general advertising and sales promotion manager Fairbanks, Morse & Co., Chicago, and after leaving that position in 1929 conducted special steel market research work for the Penton Publishing Co., Cleveland. In 1933 he was placed in charge of a newly-formed sales research department of the United States Steel Corp., with headquarters in Chicago, and on April 1 last he was appointed assistant to the vice president, with headquarters in New York.

S. T. SCOFIELD

❖ ❖ ❖

DOUGLAS VICKERS, late chairman of Vickers, Ltd., the big British steel and armaments concern, died at his London home recently, aged 76 years.

Mr. Vickers was the son of the late Colonel T. E. Vickers, chairman of the firm of Vickers Sons & Maxim, from 1873 to 1909. The firm's name was changed to Vickers, Ltd., in 1911.

Mr. Vickers entered the company in his 18th year and was appointed

a manager in 1886. He was elected a director in 1889 and managing director in 1893. He succeeded his uncle, Albert Vickers, as chairman in 1918, and retired in 1926. He was a director of several other companies and chairman of the Park Gate Iron & Steel Co. Throughout his life he took a deep interest in metallurgy and made many valuable contributions to that science.

❖ ❖ ❖

EDWARD J. STANEK, founder and president of the Stanek Tool & Mfg. Co., Milwaukee, died on Dec. 3, aged 57 years.

❖ ❖ ❖

LOUIS D. BIERSACH, president of the Biersach & Niedermeyer Co., Milwaukee, and pioneer in the American sheet metal industry, died on Nov. 27, aged 92 years. He was born in Germany and came to America in 1869, establishing his firm in 1874 with the late F. J. Niedermeyer.

❖ ❖ ❖

JOHN G. REISING, general manager of the Cincinnati Electrical Tool Co., Cincinnati, died after a long illness on Nov. 27. He was one of the pioneers in the electrical tool business in this country and had been associated with the Cincinnati company for nearly 30 years.

❖ ❖ ❖

GEORGE THOMAS, 3D, treasurer of the Lukens Steel Co., Coatesville, Pa., died suddenly at his home in West Chester, Pa., on Dec. 4, aged 65 years. He was a graduate of Haverford College and had been identified with the Lukens company for many years.

❖ ❖ ❖

LAURENCE M. HARTZELL, former assistant sales manager of the Cincinnati offices of the Carnegie Steel Co. and the Tennessee Coal, Iron & Railroad Co., died in that city on Dec. 1. At the time of his death, Mr. Hartzell was head of the Manufacturers' Agency, with offices in Cincinnati.

❖ ❖ ❖

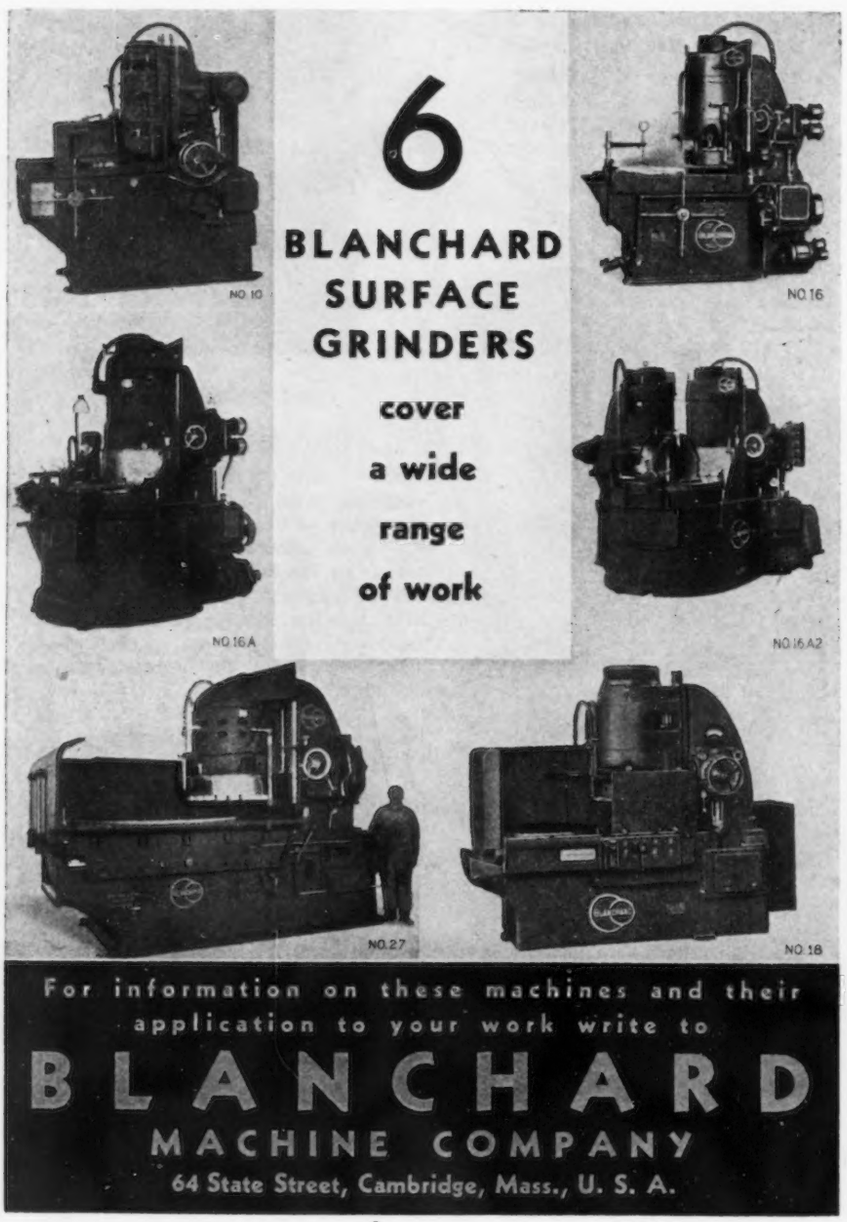
ROWLAND L. RICKWOOD, mechanical engineer connected with the Blanchard Machine Co., Cambridge, Mass., died suddenly on Nov. 30, aged 45 years.

❖ ❖ ❖

DAVID CRIGHTON HOWARD, former president of the Delaney Forge & Iron Works, Buffalo, died Nov. 23, aged 77 years. He was born in Bridgewater, Mass., in 1860 and went to work for the Delaney company at an early age. He was elected vice-president and secretary in 1905, and became president five years later. He sold his interests in 1916. During the period of 1913-14 he was president of Buffalo Rotary Club; was vice-president of the Chamber of Commerce in 1915. He was a member of the American Society of Mechanical Engineers and the Society of Naval Architects and Marine Engineers.

❖ ❖ ❖

DENNIS F. CULLINAN, purchasing agent for the Buffalo Bolt Co., North Tonawanda, N. Y., died in Buffalo on Nov. 25, aged 69 years. He had served the company and its predecessor continuously for over 51 years.



The Ingot Phase of Steel Production

UNDER the above title Emil Gathmann, president of the Gathmann Engineering Co. and of Gathmann Research, Inc., has published an 80-page book covering the modern factors involved in the production of high quality steel ingots.

The purpose of the book as stated by the author is "to tell the steel maker of new practices in this phase of production, improvements that he may or may not be familiar with, and to focus his attention on the details that make or mar the quality of his product." The book is a valuable practical treatise on a subject of fundamental interest to all steel producers and should also be of value to well informed users of steel.

SAE 1112

An Old Friend in a New Guise

IF you have been using the common ordinary grade of this Bessemer screw stock, you will get a thrill in running the new B & L grade of SAE 1112 on your automatics.

It's like meeting an old friend who has come up in the world, and seems like a different person . . . for this "Daddy of screw stocks" has really been brought up-to-date by putting it through the modern, closely supervised methods of production in B & L mills.

Its machinability has been stepped up about 10 per cent. Its uniformity and physical properties have been materially improved. It behaves better under the tool, cutting smoothly without the chips "ganging up" on the face. The finished parts show good character, and respond satisfactorily to liquid hardening treatments.

Why not give this B & L grade of SAE 1112 a try-out on your machines? Let it prove itself for you just as it has done for scores of other satisfied customers. B & L engineers will be glad to make a test run for you to demonstrate its fabricating qualities.

What is Your Problem?

For slower speed, older type machines, B & L SAE 1112 is the ideal screw stock. For modern high-speed automatics, B & L ULTRA-CUT gives maximum production. Tell us your requirements.

COLD DRAWN BARS AND SHAFTING
●
ULTRA-CUT STEEL
●
EXTRA WIDE FLATS
●
SPECIAL SECTIONS
●
ALLOY STEELS

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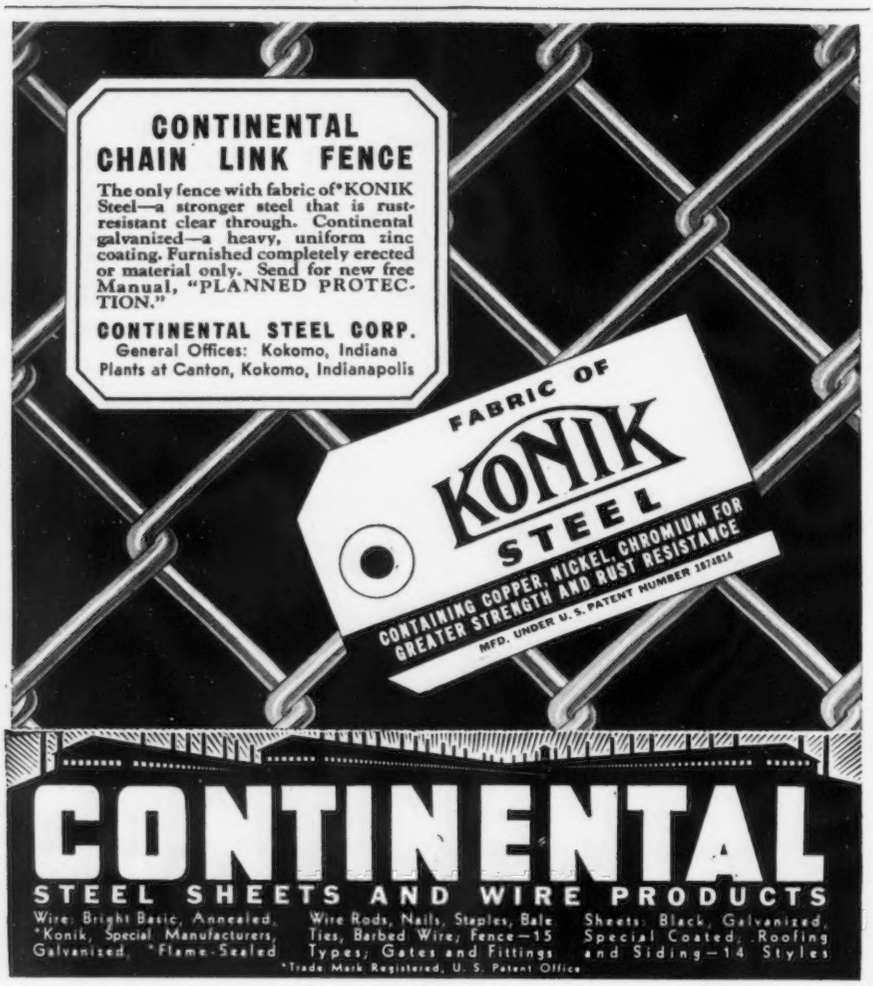
FOR EVERY MECHANICAL NEED
COIL SPRINGS
FLAT SPRINGS
WIRE SPECIALTIES
WIRE FORMS
Many manufacturers have found that they can get best results by combining their own expert knowledge of their products, with the specialized spring knowledge of America's experienced spring engineers. Let's co-operate with you.
SNAP RINGS
LOCK SPRINGS
SPECIAL SPRINGS
from Every Type of Wire up to & including ½ dia.
Send for Quotations
AMERICAN SPRING
AND MANUFACTURING CORPORATION
PARK AVE. HOLLY MICHIGAN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CHAIN LINK FENCE
The only fence with fabric of *KONIK Steel—a stronger steel that is rust-resistant clear through. Continental galvanized—a heavy, uniform zinc coating. Furnished completely erected or material only. Send for new free Manual, "PLANNED PROTECTION."
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STEEL
CONTAINING COPPER, NICKEL, CHROMIUM FOR GREATER STRENGTH AND RUST RESISTANCE
MFD. UNDER U. S. PATENT NUMBER 1874814
CONTINENTAL
STEEL SHEETS AND WIRE PRODUCTS
Wire: Bright Basic, Annealed, *Konik, Special Manufacturers, Galvanized, *Flame-Sealed
Wire Rods, Nails, Staples, Bale Ties, Barbed Wire; Fence—15 Types; Gates and Fittings
Sheets: Black, Galvanized, Special Coated; Roofing and Siding—14 Styles
*Trade Mark Registered, U. S. Patent Office

Japan To Curtail 1938 Scrap Imports

TOKYO, Japan (*Special Correspondence*).—The Japanese Government has decided to limit scrap iron imports to 1,200,000 tons next year, although the actual demand may exceed 2,000,000 tons.

Scrap iron imports into Japan have been increasing annually and are expected to reach an all-time high of 1,800,000 metric tons for the current year.

In view of the projected import limitation, domestic quotations are tending upward and have long gone above the Y100 mark in Japanese currency (approximately $28¾).

Prosser Firm Moves After 92 Years In One Building

AFTER 92 years at 15 Gold Street, New York, Thomas Prosser & Son, importers, engineers and dealers in steels, mechanical specialties and machinery, and since 1851 American representative of the Krupp Steel Works, Germany, will move Dec. 11 to larger quarters at 120 Wall Street, New York.

The business was established by Thomas Prosser in 1845 and is being carried on by his great-grandson, Roger D. Prosser. In 1845 the founder introduced into the United States a lap welded boiler tube invented by Richard Prosser, of Birmingham, England, representing, it is stated, a revolution in boiler making. Introduction of these tubes made possible the use of higher steam pressures, which necessitated some better means of securing the tubes in the tube plate. This led to the invention by Thomas Prosser in 1849 of the first tube expander.

For many years the firm of Thomas Prosser & Son imported a large percentage of the locomotive tires, wheels and rails used by American and Canadian railroads. They also imported much of the earliest alloy steels produced for use in automobiles. Much more recently the firm introduced cemented tungsten carbide, developed by the Krupp company and used extensively in machine shop practice. It is now engaged in the manufacture of cemented-carbide tool grinders and other mechanical specialties and in the importation of Krupp steels, hardened steel rolls, chilled cast-iron rolls, and rolling mill machinery.

Light Steel Ban Hits N.Y. Housing

AN alteration to New York City's building code eliminating use of steel bar joist members and junior steel beam construction will hamper building of low cost homes in that city, Langdon W. Post, New York Tenement Housing Commissioner, declared this week.

"To keep out of New York a type of fire-resistive construction recognized throughout the country as being adequate is without justification, and the building industry is entitled to some explanation as to why such action was taken," Mr. Post, recently chairman of the New York City Housing Authority, said.

The new code, changed on recommendation of Samuel Fassler, Manhattan, Commissioner of Buildings, that "light steel construction was hazardous," requires that steel structural members in residential buildings up to 100 ft. in height must be of solid steel construction of not less than 0.23 in. in thickness, Mr. Post pointed out.

Great Lakes Steel Plant Installs Third Pickler

THE Great Lakes Steel Corp., Ecorse, Mich., subsidiary of National Steel Corp., has recently completed installation of a third continuous strip pickler. The unit is one of the widest continuous picklers in the United States, having an inside finished width of 104 in., which permits the handling of strip 92 in. wide from the company's new strip mill.

Designed by engineers of Great Lakes Steel in cooperation with engineers of the B. F. Goodrich Co., Akron, Ohio, the equipment consists of four separate 60-ft. acid tanks and two 26-ft. water tanks. All tanks are constructed of heavily reinforced welded steel, lined with Triflex rubber and sheathed inside with 8 in. of acid-proof brick jointed by a special sulphur base compound.

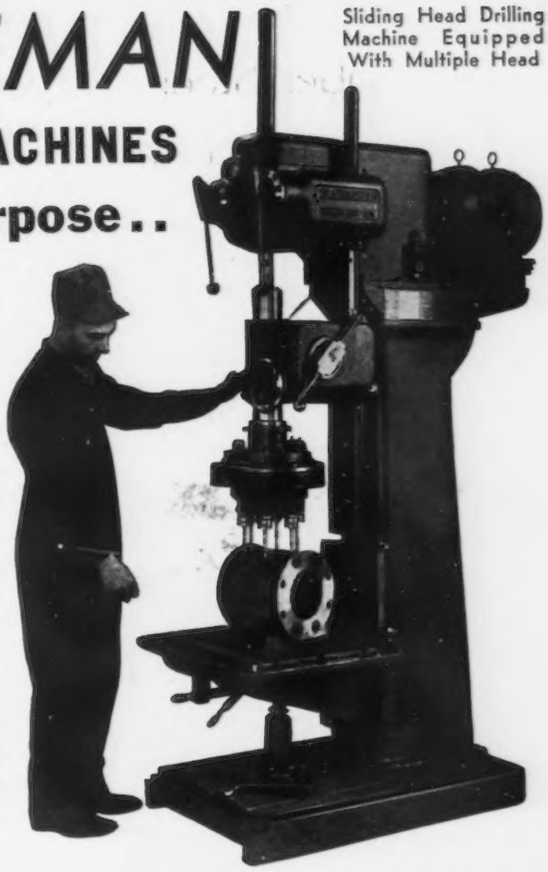
The pickling room is entirely free from acid fumes as the tanks are covered with sectional hoods connected to a ventilating and sewer system of compact design. All auxiliary equipment is of Triflex-lined construction.

Trane Co., La Crosse, Wis., manufacturer of heating, cooling, and air conditioning equipment, has established a new transportation department at 852 North Rush Street, Chicago.

CLEEREMAN

DRILLING MACHINES *for* Every Purpose..

Sliding Head Drilling Machine Equipped With Multiple Head



● The heavy duty drill shown is one of a complete line of drilling machines . . . it is fully geared . . . automatically oiled . . . has full anti-friction bearings . . . is furnished with plain or heavy duty compound table . . . has reverse for tapping direct through motor . . . and is furnished in a wide range of sizes.

Cleereman Drilling Machines include various types of accurate drills. Tell us your drill requirements—we will be glad to send bulletins giving data.

CLEEREMAN MACHINE TOOL COMPANY
GREEN BAY . . . . . WISCONSIN

USING CHACE Thermostatic BIMETAL in the SQUARE D Double-Break CIRCUIT BREAKER

Chace Thermostatic Bimetal is the active element employed in the new Square D double-break circuit breaker, which automatically breaks the circuit should an "overload" or "short" occur. Where temperature is a factor and positive, unfailing automatic movement is required, use Chace Thermostatic Bimetal. Offered in various types, each to meet specific demands.

W. M. CHACE CO.
1605 Beard Avenue - - - Detroit Mich.

November Steel Output Drops 37% From October and 59% From March

OPEN-HEARTH and bessemer steel ingots produced during November amounted to 2,153,781 gross tons, a decline of almost 37 per cent from October and 59 per cent below March, the peak month of 1937, according to the monthly report of the American Iron and Steel Institute.

The total for November was the lowest monthly volume since December, 1934, when 1,964,257 gross tons was produced. Output in October of this year amounted to 3,392,691 gross tons, while the March tonnage was 5,216,666. The November volume showed a decline of 50 per cent from November, 1936, when 4,323,025 gross tons was produced.

Last month the industry operated at 38.22 per cent of capacity, compared with 58.31 per cent in October and 76.94 per cent in November of last year.

Despite the sharp decline in steel output in recent months, the total of 48,045,241 gross tons of ingots produced in the first 11 months of this year is nearly 5 per cent ahead of output in the corresponding period of 1928, the second biggest steel year on record.

Production in the first 11 months of that year aggregated 45,846,977 gross tons, but over 4,000,000 tons were produced in December of that year, raising the year's total to 49,865,185 gross tons.

In the first 11 months of 1929, the peak year, 51,409,267 gross tons was produced, or about 7 per cent more than in the corresponding period of this year. The total for 1929 was 54,312,279 gross tons.

High Speed Hammer Co., Inc., 313 Norton Street, Rochester, N. Y., has appointed the following new sales agents: W. S. Gallagher, 1807 Elmwood Avenue, Buffalo, for that part of New York State lying west of Rochester, including Erie County, Pa., and H. A. Smith Machinery Co., Erie Boulevard East and South Townsend Street, Syracuse, N. Y., for the Eastern section of upstate New York.

FOR REAL SERVICE USE CLARK

BOLTS
NUTS
SCREWS
& RIVETS

Considering the Quality, the prices are surprisingly low.

Since '54
CLARK BROS BOLT CO.
MILLDALE, CONN.

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS

(Reported by Companies Which in 1936 Made 98.29 Per Cent of the Open-Hearth and 100 Per Cent of the Bessemer Ingot Production)

	Reported Production (Gross Tons)		Calculated Production All Companies			
1936	Open-Hearth	Bessemer	Monthly	Weekly	Number of Weeks	Per Cent of Capacity
January	2,794,766	196,389	3,039,804	686,186	4.43	52.39
February	2,707,320	202,445	2,956,891	714,225	4.14	54.53
March	3,094,939	185,040	3,333,853	752,563	4.43	57.46
1st Quarter	8,597,025	583,874	9,330,548	717,734	13.00	54.80
April	3,565,761	304,775	3,932,605	914,593	4.29	69.99
May	3,671,375	302,092	4,037,375	911,371	4.43	69.58
June	3,578,383	334,897	3,975,569	926,706	4.29	70.75
2nd Quarter	10,815,519	941,764	11,945,549	918,182	13.01	70.10
1st 6 Months	19,412,544	1,525,638	21,276,097	817,997	26.01	62.45
July	3,526,380	326,606	3,914,370	885,604	4.42	67.61
August	3,768,135	350,560	4,184,287	944,534	4.43	72.11
September	3,782,498	303,048	4,151,388	969,950	4.28	74.05
3rd Quarter	11,077,013	980,214	12,250,045	932,981	13.13	71.23
1st 9 Months	30,489,557	2,505,852	33,526,142	856,570	39.14	65.40
October	4,144,395	317,710	4,534,246	1,023,532	4.43	78.15
November	3,925,146	329,553	4,323,025	1,007,698	4.29	76.94
December	4,048,552	305,342	4,424,367	1,000,988	4.42	76.42
4th Quarter	12,118,093	952,605	13,281,638	1,010,779	13.14	77.17
Total Year	42,607,650	3,458,457	46,807,780	895,329	52.28	68.36
1937						
January	4,357,338	291,794	4,724,939	1,066,578	4.43	81.43
February	4,012,358	331,669	4,413,832	1,103,458	4.00	84.25
March	4,730,579	403,787	5,216,666	1,177,577	4.43	89.91
1st Quarter	13,100,275	1,027,250	14,355,437	1,116,286	12.86	85.23
April	4,601,620	390,198	5,071,875	1,182,255	4.29	90.27
May	4,685,749	386,290	5,153,559	1,163,332	4.43	88.82
June	3,832,514	284,572	4,183,762	975,236	4.29	74.46
2nd Quarter	13,119,883	1,061,060	14,409,196	1,107,548	13.01	84.56
1st 6 Months	26,220,158	2,088,310	28,764,633	1,111,891	25.87	84.89
July	4,148,389	336,035	4,556,596	1,030,904	4.42	78.49
August	*4,425,255	373,428	*4,875,671	*1,100,603	4.43	*83.79
September	3,961,009	271,948	4,301,869	1,005,110	4.28	76.52
3rd Quarter	12,534,653	981,411	13,734,136	1,046,012	13.13	79.64
1st 9 Months	38,754,811	3,069,721	42,498,769	1,089,712	39.00	83.12
October	3,148,668	189,244	3,392,691	765,844	4.43	58.31
November	2,005,136	113,761	2,153,781	502,047	4.29	38.22

*Revised.

CLEVELAND TRAMRAIL MATERIALS HANDLING EQUIPMENT

CLEVELAND TRAMRAIL

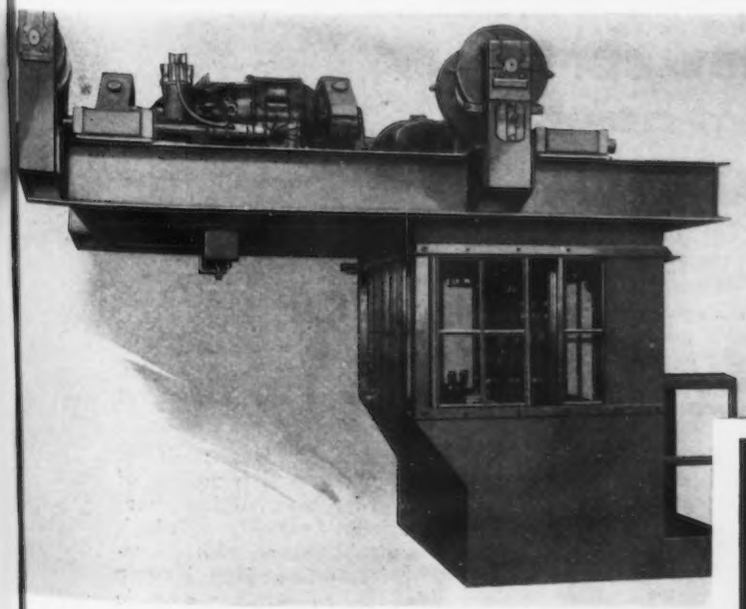
Consult your 'phone directory under Cleveland Tramrail

Warehousing of Wire and Wire Products
via
CLEVELAND TRAMRAIL

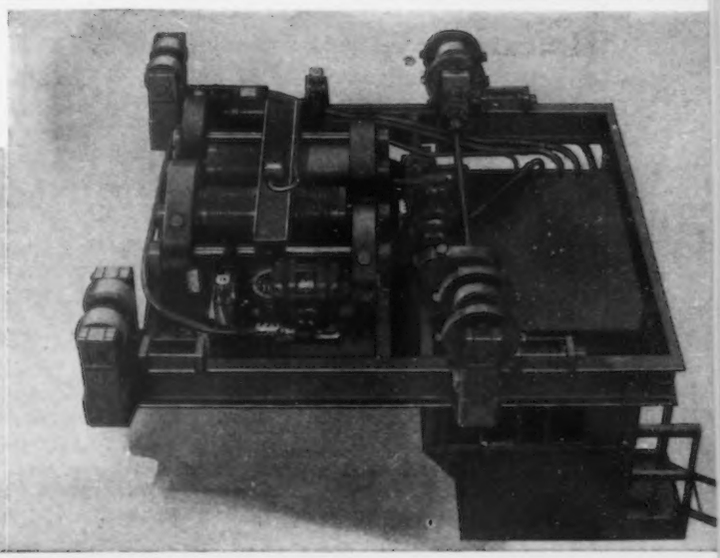
Kegs of nails, bolts, etc., are lifted on pallets and piled six high. Each lift picks up thirty-two 100 pound kegs.

CLEVELAND ALL WELDED CRANES FOR EVERY INDUSTRY

• For the special as well as the standard designs, Cleveland is well equipped, by reason of their varied engineering and manufacturing background to design and build your special requirements.



An Underslung 2½ Ton Bucket Trolley with cage attached.



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ELECTRIC WELDED TUBING . . . For all Mechanical Purposes.

UPSETTING — FLANGING — TAPERING AND BENDING

Iron and Steel Imports Continues at Low Level

(CONTINUED FROM PAGE 58)

last year of 436,604 tons valued at $18,371,890, thereby recording a 7.6 per cent decline in volume, but a 15.8 per cent increase in value. The leading source of our import trade in the first 10 months of 1937 in iron and steel products was Belgium, whose total of 122,614 tons, compared with 94,995 tons in the like months of 1936, and included appreciable quantities of shapes, bars and hoops. Germany ranked next with 67,832 tons, against 84,726 last year.

Evidence of the strong European market for iron and steel products is furnished in the fact that exports of those items from the United States to a number of European countries registered a pronounced increase thus far in 1937. Shipments to the Netherlands doubled, those to Norway and Belgium trebled, and those to Germany, France and Sweden were many times greater than in 1936. In addition, exports to both Canada and Britain more than doubled.

Details of exports of iron and steel products from the United States appeared last week on page 89.

British Trying To Stabilize Scrap

LONDON (*Special Correspondence*).—With the object of stabilizing scrap prices for 1938, the executive committee of the National Federation of Scrap Iron and Steel Merchants will meet the British Iron and Steel Federation early in December. There will be a general review of the operation of the scrap agreement formulated earlier this year.

This agreement was made to regulate prices and supplies of scrap in order to eliminate alternative periods of scarcity with high prices and abundance with uneconomic prices. The four leading firms in the British scrap trade are Thomas W. Ward, George Cohen Sons & Co., Cox & Danks, and Arnott Young & Co.

In accordance with the stabilization policy of the federation, it is probable that an effort will be made to stabilize scrap prices for the entire year.

British Hematite Pig Iron Producers Lift Prices Jan. 1

LONDON *(Special Correspondence)*.—British hematite pig iron producers have made their long-awaited statement regarding future price policy through the British Iron and Steel Federation.

Hematite pig iron prices are to be raised by amounts varying from 7s. 6d. to 18s. 6d. ($1.87 to $4.62) per ton after the end of the year. Hematite steel quotations will remain unchanged. The advance of prices has been agreed upon by the National Association of Hematite Pig Iron Makers, with the concurrence of the Import Duties Advisory Committee.

There will be an increase of 10s. ($2.50) per ton (in the case of South Wales 7s. 6d. per ton for pig iron arising in that area) on the basis price for mixed numbers. In addition there will be an increase in the extras for special qualities of 4s. 6d. ($1.12) for iron containing 0.03 per cent of sulphur and phosphorus, of 6s. 6d. ($1.62) for 0.025 per cent, and of 8s. 6d. ($2.12) for 0.02 per cent of these impurities.

Effective Jan. 1

These prices will, for all new business, be made effective Jan. 1 and will hold until Dec. 31, 1938, subject to the proviso in all sales and contracts that deliveries after Dec. 31, 1938, will be at association prices then ruling. Deliveries against existing sales and contracts will continue to be made within the terms of the contracts.

Agreement not to increase prices above the present level until the end of 1938 covers the main acid steel products. It was reached by the following steel associations, with the concurrence of the Import Duties Advisory Committee: Siemens Martin Acid Steel Billet Association, Forging Ingot Makers' Association, Alloy Steels Association, Forging, Drop Forging and Stamping Blooms, Slabs and Billets Association. There is again the proviso in all sales and contracts that deliveries after the end

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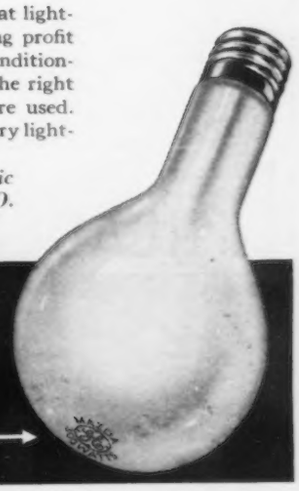
The G-E Light Meter indicates light as simply as a thermometer measures temperature. Every plant executive should have one. Priced at only $11.50.

When a rush of work at the Curtiss Aeroplane & Motor Company's Buffalo plant recently necessitated more work from the design department, the men complained of headaches and eyestrain. Experiments were undertaken to determine the best light for the critical seeing task involved. Lighting engineers recommended a light-conditioning installation that would produce about 50% more light of a better quality than before.

According to the chief engineer at Curtiss, the new lighting has effectively solved the headache problem and has effected an outstanding improvement in employee satisfaction. A lighting check-up in your plant may show that light-conditioning will more than pay its own cost in stopping profit leaks and by increasing efficiency. For industrial light-conditioning is simply providing the right amount of light and the right kind of lighting for seeing and comfort wherever eyes are used. Your local lighting company will gladly make the necessary lighting check-up.

For specific information, write to General Electric Company, Dept. 166-I, Nela Park, Cleveland, O.



GENERAL ELECTRIC MAZDA LAMPS

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of 1938 will be at association prices then ruling.

Find Increase Necessary

The British Iron and Steel Federation states that the increased cost of raw materials has fallen with particular severity on the hematite pig iron industry, and has necessitated this increase in prices.

The decision of the steel associations using hematite to refrain from an increase in steel prices, despite the increase in hematite, has been taken as a contribution to the British Iron and Steel Federation's policy of stabilization (already adopted in regard to basic iron and steel), and with the object of prolonging the present level of trade activity.

The National Association for Rolled and Rerolled Products announces that it has agreed, in pursuance of the federation's policy, not to increase the present price of its hematite qualities up to the end of 1938. A similar decision has been announced by the Rail Makers' Association and by the National Forgemasters' Association in respect of steel forging.

Just prior to these announcements the makers of foundry and forge pig iron with a phosphorus content of 0.75 per cent and upwards made public their decision to stabilize the present prices for the first six months of 1938, subject to certain minor adjustments.

These decisions have set at rest the remaining uncertainty as to British steel prices. Although not affecting such a large quantity of products as the decision to stabilize basic steel quotations until the end of 1938 (announced on Nov. 8), the hematite makers' declaration is of great importance to all consumers of the finer qualities of steel.

Good Gears are Better Gears

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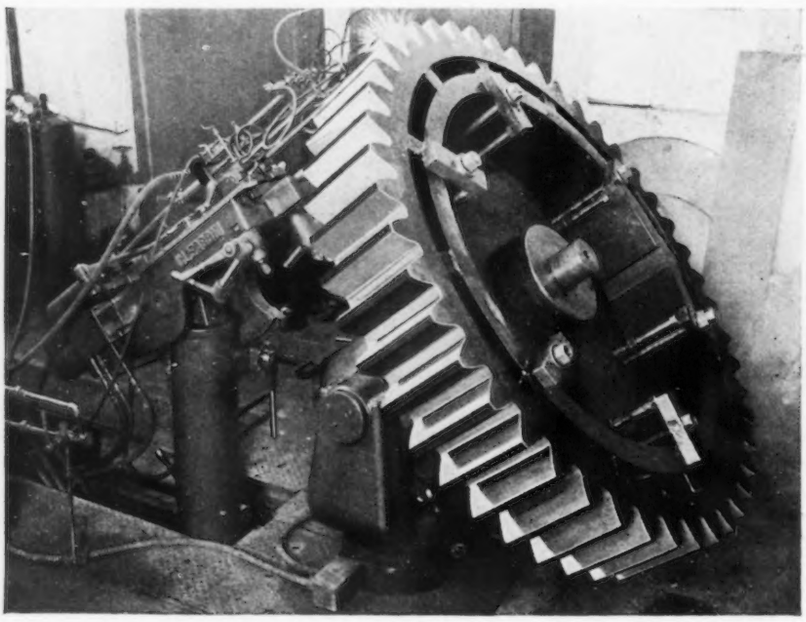

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Architect Doubts Cost Halts Building Recovery

HIGH costs do not necessarily prevent recovery in building, Albert J. Evers of San Francisco, director of the American Institute of Architects, suggests in his annual report on conditions in the Sierra Nevada district of the institute, embracing California, Nevada, Arizona, and Hawaii.

"Building costs will probably remain high, and it is during periods of high building costs that the most building has been done," said Mr. Evers. "I believe that the constant harping on the subject of high building costs and labor troubles has had a markedly adverse effect on building volume."

Blackmer, President of Steel & Wire, Honored

A TESTIMONIAL dinner was tendered this week to C. F. Blackmer, president, American Steel & Wire Co., by citizens of Waukegan and North Chicago, Ill., in commemoration of the 46th anniversary of the first drawing of wire in that area, and in celebration of the beginning of modern industry in that community.

Mr. Blackmer, who now resides in Cleveland, was at one time superintendent of the Waukegan works of the company. Other speakers at the banquet given by the local chamber of commerce included J. A. Coakley, manager of traffic, United States Steel Corp. subsidiaries, M. W. Reed, vice-president, American Steel & Wire Co., and Fred Ingraham, manager of operations for the wire company in the Chicago district.

SWOC Will Ask Checkoff, Closed Shop, White Warns

WARNINGS against the closed shop and the checkoff of union dues among workers in the steel industry came this week from Charles M. White, vice-president in charge of operations of Republic Steel Corp.

Speaking at the annual meeting of the National Industrial Council in the Waldorf-Astoria Hotel, New York, Mr. White declared that the Committee for Industrial Organization, parent agency of the Steel Workers Organizing Committee, is having "money trouble."

This means, declared Mr. White, that the next step by the SWOC (which holds its national convention Dec. 13-14-15 at Pittsburgh) will be a demand that steel companies agree to the closed shop and the checkoff.

Checkoff "Un-American"

In a labor relations discussion before the council, Mr. White, according to the abstract of his speech, explained that Republic Steel fought the CIO and refused a union contract last spring because it considered the closed shop and the checkoff "dangerous, un-American and undemocratic." Mr. White said:

"The CIO has another problem which it must solve. Negotiations with the employer cannot be carried on by hot-tempered, inexperienced men who have reached their position largely because they talk loud, long and fluently in union organization meetings. The union bargainers who meet with the heads of large corporations must be men of experience and knowledge and must have some fundamental sense of business organization and administration and of economics.

"You can't train a man like that in a day or two. We estimate that it takes at least five years to properly train a man in our industrial relations department. We believe it takes equally long to train a union representative so that he can adequately discuss problems with the employer.

Union Lacks Money

"The CIO now finds itself in a difficult position. The money hasn't come in. The CIO and its organizers told the men, in substance: If we can get enough of you, we can get the world with a fence around it. In the vast majority of cases, however, the most the CIO was able to get was a contract with little more than it had before the contract was signed.

"The next step therefore will undoubtedly be the demand for first the closed shop and then the checkoff. The dangers of the closed shop and the checkoff are readily apparent, and our attitude in fighting the signing of a contract last spring is entirely understandable.

"In order to exist, a union must have money. Steady, regular income cannot be assured unless dues are collected through the checkoff system. No matter how little a man is getting, the union gets its 100 per cent collection before anyone else is allowed his share. As

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a result, union officials are securely entrenched in their positions.

Can Dictate Policies

"With ample finances they frequently can dictate the policy of a company to an equal or greater degree than the actual owners. They are able to do so because they, in the last analysis, supply and control that vital part of any industrial organization, the workmen.

"The next step, too frequently, is that racketeers seeing a rich treasury, either take over the union or ally themselves with its leaders.

"Industry's experience with these two forms of union domination, the closed shop and the checkoff, has not been a happy one. On the surface they appear to be of advantage to the men themselves, but any kind of analysis will show they are just the opposite. The closed shop removes from the workman his freedom of choice in picking a job. It makes him to a considerable extent an indentured serf to the organization for which he is working.

Saddled With Men

"Under these conditions, too, the employer finds himself saddled with the men on his payroll when the closed shop contract is signed. He can't hire or fire without the approval or permission of the union. Any man who is discharged is, according to the union, discharged because of union activities and his case is immediately taken to the Labor Board."

CHARLES M. WHITE

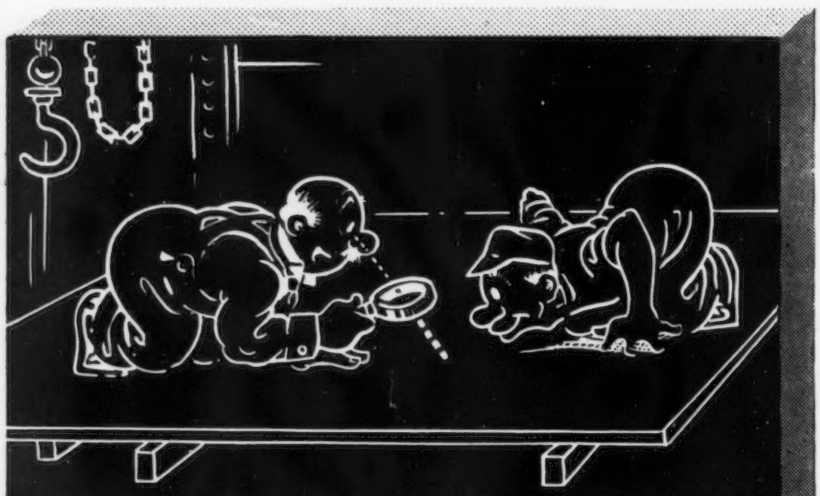
Among other steel manufacturers scheduled to speak before the National Industrial Council later this week were Frank Purnell, president Youngstown Sheet & Tube Co.; Ernest T. Weir, chairman, National Steel Corp., and Charles R. Hook, president, American Rolling Mill Co. Tom M. Girdler, Republic Steel chairman, was to preside at a luncheon meeting on the council's "Labor Day," Dec. 9.

Claims Wages High

Gen. Hugh Johnson, newspaper columnist and former NRA head, and Mrs. Mary T. Norton, chairman, House Labor Committee, were scheduled to speak Dec. 9.

A declaration by Lewis H. Haney, professor of economics at New York University, that wages are inflated was the highlight of the opening day at the council's annual meeting.

"We have learned in 1937 that wages are inflated," said Mr. Haney in the abstract of his



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CENTRAL IRON AND STEEL COMPANY
HARRISBURG, PENNSYLVANIA

speech. "For four and one-half long years now—and for about five long years before that—many business men and most politicians in this country have been trying to arrange the payment of wages regardless of products. They do not put it that way. But they call it by that phrase of abominations, 'creating purchasing power.'"

Wagner Act Attacked

Urging the scrapping of the Wagner Act and the National Labor Relations Board Mr. Haney said, "I believe collective bargaining is necessary. But fair agencies and the adoption of means to encourage the resort of both parties to such agencies is essential.

"The labor group must be a unit both geographically and occupationally. This is one of the fatal weaknesses of the CIO setup. It is a travesty on collective bargaining to have a national or international group of all sorts of laborers bargaining with a single local employer.

"I suspect that we will not have fully learned this lesson until we realize that 'the high wage policy' is exactly as bad as 'the easy money policy.'

"The idea that the laborer has a right to his job is another vicious notion. It is this notion which lies back of the sit-down strike. A laborer may argue that he has done this job for the best years of his life, and that he has made it his, in the sense that no one has a right to come in and replace him. That, however, is a confusion of thought. The trouble is that he wants to make that job a different job.

Sits With Communism

"When the laborer seeks to make the job include a part of the job of the employing enterpriser, or to change it by having less work for more wages, it is not the same—it is no longer his old job. The sit-downer may be sitting with some Communist's dream of a job.

"Communism is playing an increased part in the American labor movement. It follows that the thing has become more than merely organized labor or the labor movement; it has become in part a radical collectivist movement."

Color Code For Various Tool Steels

ALTHOUGH tool steel is produced in an unlimited number of varying analyses, there is nothing in the general appearance of many grades to distinguish one from another. Without marking of some kind, an expert could not tell them apart without making a series of tests. Labels and bar end painting are the common methods of identification. As the bars are used up, however, these markings are often destroyed, and the distinction between the characteristics of various grades of tool steels is so fine that any substitution, through error, is the beginning of a rapidly mounting loss. If, as frequently happens, the mistake is not detected until revealed in the performance of the finished tool, all of the expensive toolmaking and heat treating time will have been wasted. Delays in production while the tools are being remade are a further loss.

To prevent errors such as this, A. Milne & Co., after considerable experimentation, has devised a color bar plan. With this method, colors still are used to identify the various grades of Milne tool steel,

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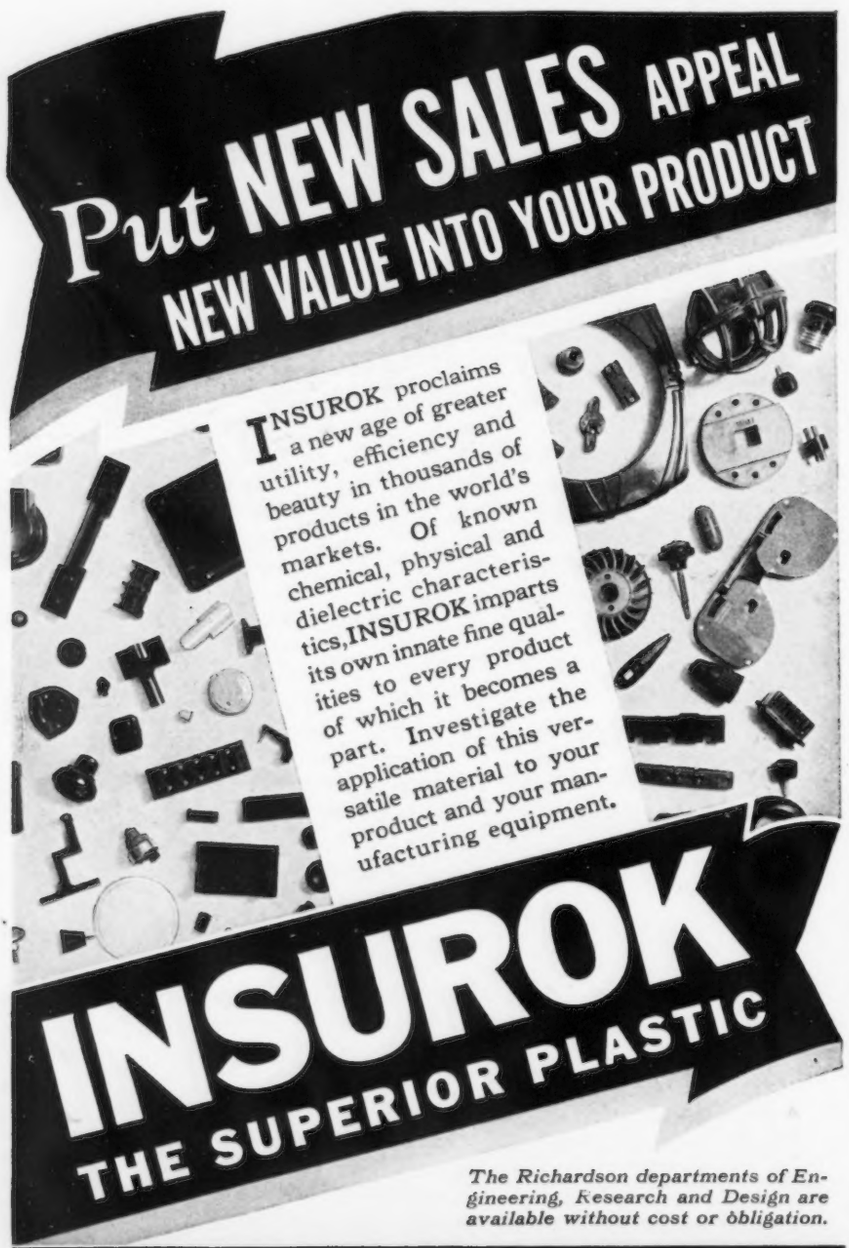
but the color coating is sprayed over the entire surface of the bars.

There are many advantages of the color bar plan to any plant, large or small, that keeps a stock of tool steel. A bar may be quickly identified, even by inexperienced stock clerks, no matter how much has been cut from it. Also, after cutting, short ends will not be misplaced in the racks with other grades. When the steel reaches the toolmaker, he can tell definitely, knowing the color bar code, whether the steel delivered to him is correct. No matter how small the piece to be worked, he is no longer dependent on the stock clerk for the proper selection. The heat treater can confidently follow heat treating instructions, knowing by the color that the steel is the one specified. This positive identification also allays doubts as to machining and procedure in other forming operations.

In order to educate stockroom clerks, toolmakers, and heat treaters in the color bar code, large wall charts are being distributed by A. Milne & Co. which show the actual colors used to identify the several grades. Recommendations for heat treatment of each steel are printed on the chart. The color bar plan is also described in the new A. Milne & Co. catalogue and in sales literature, to quickly familiarize tool steel users with its advantages and with the bar colors.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Chicago Code Permits Welding

PROGRESS in use of welding in building construction was given new impetus last month when the city council of Chicago approved revision of the city's building code to permit use of welding in structural work. Structural welding now has the official stamp of approval of the country's two largest cities, New York, only a few months ago, having recognized welding by revising its building code to permit the welding of buildings effective Jan. 1.

"Welding," reads the Chicago code, "or any combination of riveting, bolting and welding may be used for the connecting or assembling of component parts of metal beams, columns or trusses, or other members, and for connecting such members to one another to make up the frame of a building or a structure; except that the strength of any one joint shall be considered as the strength of the welded joints alone or as the strength of the rivets or bolts. Surfaces to be welded shall be free from loose mill scale, rust, paint or other foreign matter. No welding shall be performed in a strong wind or in rain until adequate protection has been provided."

Approval of welding by New York and Chicago is concrete evidence of the progress of a new structural process which has been gaining favor because of its advantages, comments the James F. Lincoln Arc Welding Foundation, Cleveland, which is sponsoring a $200,000 nationwide arc welding award program, which includes 24 awards totaling $14,200 for studies of welded design in the structural field and four principal awards totaling $26,000 which structural studies may also win.

Chandler & Farquhar Co., Inc., 260 Devonshire Street, Boston, mill supplies, on or about Jan. 1 will be located at 900 Commonwealth Avenue.

Dutch Shipyard Buys Plates in U. S.; Cartel Discusses American Competition

HAMBURG, GERMANY *(Special Correspondence)*.—It has caused some sensation that the Dutch shipyard which booked an order for five tankers of a total of 68,000 tons from the Royal Dutch Petrol Co. has placed the order for the ship plates in the United States and not on the Continent. American prices were cheaper, and they would guarantee delivery at a specified time, which the Continental works were unable to do.

American steel competition was one of the main objects of discussion at the last Paris meeting of the European Steel Cartel. The outlook for an extension of the existing agreements on rails (IRMA) and tin plate, also on other iron and steel products, are considered to be not very promising at present. The general opinion expressed at the Paris meeting concerning development of the iron and steel export market was quite optimistic. Export business in pig iron, heavy plates and hot-rolled hoops is improving, but in all other products is very quiet.

Germany's iron ore production of 800,710 tons in October was the highest for any month in postwar years. Production will now rise from month to month due to the iron ore mining expansion under the Reichswerke Hermann Göring. More ores are being imported from Spain, the total from Bilbao in October having been 141,000 tons.

The general trend of the machinery export trade is satisfactory. The demand for almost all machinery products is well maintained. Prices are unaltered. The German works report to be fully booked with export orders for about 10 months. Most remarkable was the increase of diesel engines, which rose to 80.2 million marks in the first 10 months this year, a 55 per cent gain over last year. In this connection it is of interest that Germany's air arm is the only one in Europe using diesel engines extensively for almost all heavy and also some types of medium bombers.

Scrap Purchases

Reports were current on European markets recently that more than 2,000,000 tons of American steel scrap had been purchased by European scrap merchants, members of the International Scrap Cartel. No such purchases were effected, although the quantities contracted for are large. In August 500,000 tons was bought at an average price of $21.50 f.o.b. American Atlantic and Gulf ports; September purchases were 200,000 tons at $19.24 average; October purchases were 150,000 tons at $16.50 average, and November purchases up to Nov. 27 (which terminates the November buying) were about 180,000 tons at $16 average. Purchases will continue during the next few months.

Great Britain is taking for the first quarter of 1938 an additional quantity of semi-finished steel amounting to about 125,000 tons. Germany is not participating in this business, as the full production is needed for the domestic demand and the German works

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cannot execute a part of the order.

Raw material supplies to German iron and steel works are constantly improving, although stocks are not yet existing. Additional ore supplies from Spain and other countries have enabled the German iron masters to blow in more furnaces and it is probable that by the end of this year the total will be brought to 130 (117 in January). The finished steel industry is still suffering from a delayed supply of semi-finished steel.

Japanese Adopt Five Year Plan To Lift Steel Output

TOKYO (*Special Correspondence*).—In line with the reorganization of Japan's economy and finance on a wartime basis, various steps have been taken to meet the mounting demand for iron and steel.

These steps include establishment of a joint sales company, control of wholesale dealers, retrenchment of consumption and official fixing of prices.

But they are little more than temporizing measures and have failed to contribute anything to the projected enlargement of productivity. The Government therefore has worked out a new expansion plan to be carried out over five years up to 1941, and accordingly the Nippon Iron Mfg. Co., a semi-governmental firm, has decided upon a project to increase its own iron steel production. This five-year plan will be enforced both in Japan and Manchoukuo.

Larger Output Planned

Under the Hayashi Cabinet, the then Commerce and Industry Vice-Admiral Takuo Godo drew up a five-year plan which contemplated to expand the output to 6,200,000 metric tons for rolled steel and to 5,900,000 tons for pig iron.

He estimated that if these amounts would be produced in 1941, there would be no dislocation of the local market. However, his estimates were considered by all quarters concerned as being too conservative.

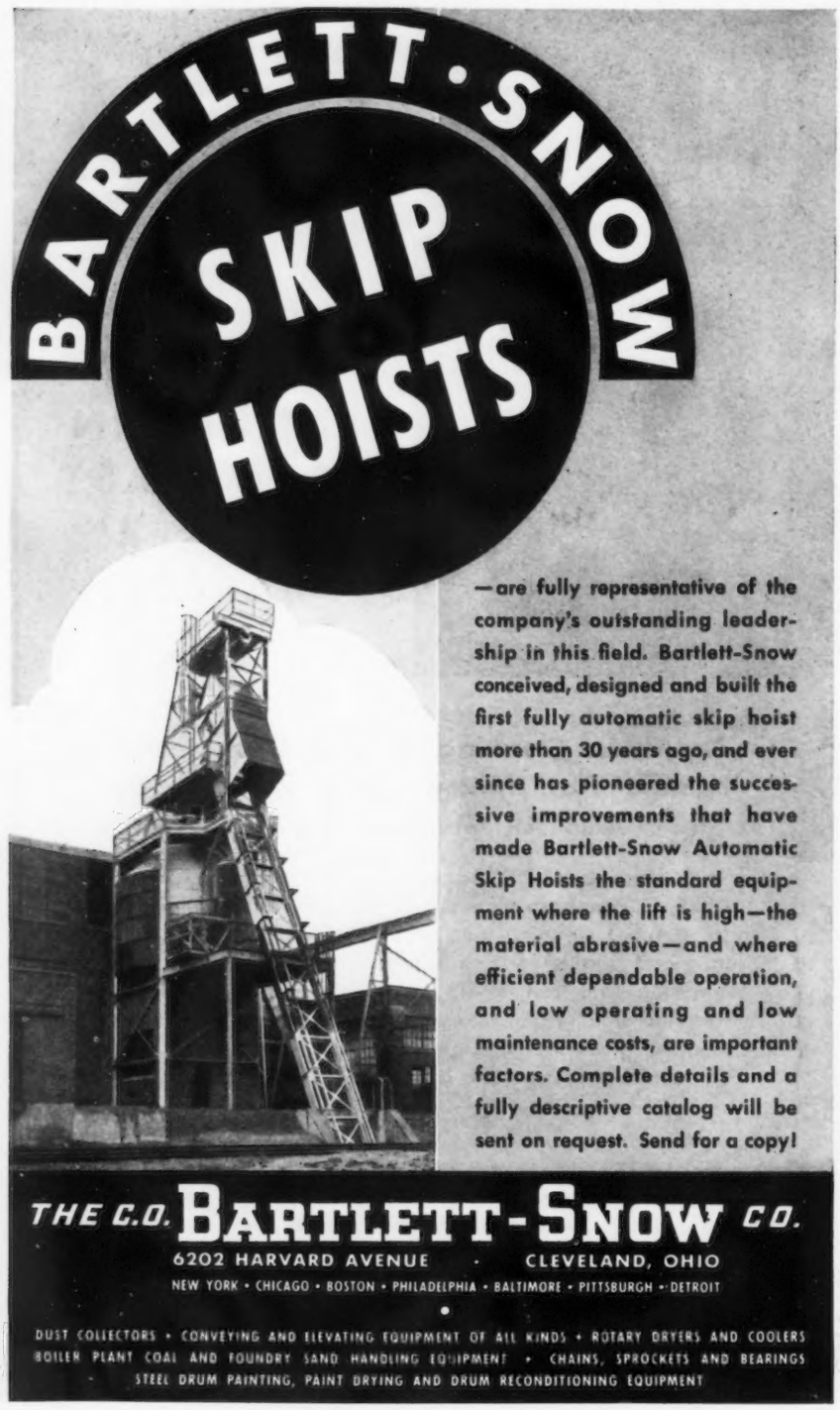
Such being the case, the Konoe Government was obliged to revise the Godo program and project larger production. Under its new five-year plan, the output is to be increased to 10,000,000 metric tons for rolled steel and to 11,350,000 metric tons for pig iron in the Japan-Manchoukuo economic bloc.

To attain such high marks, not only must many expansion plans be rushed but also new projects be worked out. The capacity of the existing facilities is estimated at 2,420,000 tons a year for pig iron, 5,160,000 tons for steel ingot and 5,010,000 tons for rolled steel. These figures will increase by 3,320,000 tons, 2,030,000 tons and 1,710,000 tons respectively when the expansion plans already decided upon are completed.

Expansion Necessary

Further, they must be expanded by 2,000,000 tons each in the case of pig iron and steel ingot and 1,600,000 tons for rolled steel by new enlargement projects, as may be noted in the following table (in 1000 metric tons):

	Pig Iron	Steel Ingot	Rolled Steel
Existing plants ...	2,420	6,160	5,010
Plans decided upon	3,320	2,030	1,710
Plans to be worked out	2,000	2,000	1,600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—are fully representative of the company's outstanding leadership in this field. Bartlett-Snow conceived, designed and built the first fully automatic skip hoist more than 30 years ago, and ever since has pioneered the successive improvements that have made Bartlett-Snow Automatic Skip Hoists the standard equipment where the lift is high—the material abrasive—and where efficient dependable operation, and low operating and low maintenance costs, are important factors. Complete details and a fully descriptive catalog will be sent on request. Send for a copy!
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DUST COLLECTORS · CONVEYING AND ELEVATING EQUIPMENT OF ALL KINDS · ROTARY DRYERS AND COOLERS
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STEEL DRUM PAINTING, PAINT DRYING AND DRUM RECONDITIONING EQUIPMENT

Such large scale projects cannot be carried out by private interests alone, and the Nippon Iron Mfg. Co. is taking the lead of the drive for larger productivity.

By its four-stage plan to be completed by the middle of 1941, the Nippon Iron Mfg. Co. contemplates to expand its capacity by 2,600,000 tons for pig iron, 1,300,000 tons for steel ingot and 1,300,000 tons for rolled steel.

Blast Furnaces Planned

In the first stage, the firm plans to improve and enlarge its existing plants at Yawata and elsewhere.

In the second stage, Nippon Iron projects to build a 1000-ton blast furnace at Yawata and two units of 350-ton plants, one at Wanishi in the Hokkaido and the other at Kenjiho in Korea, the combined capacity of which is estimated at 610,000 tons a year. And they are to be completed by the end of 1937.

Further, another unit of 1000-ton plants (whose annual capacity of pig iron will be 350,000 tons) will be established at Yawata, a 700-ton furnace (annual capacity, 250,000 tons) at Kamaishi in Miyagi Prefecture, and four units of 100-ton open hearth plants (annual capacity of steel ingot, 300,000 tons). These projects will be completed by the end of 1938.

The third stage calls for enlargement of the Wanishi factories on a large scale. Three 700-ton blast furnaces (annual capacity of pig iron, 700,000 tons), six 120-ton open hearths (annual capacity of steel ingot, 500,000 tons) and large rolling mills (annual capacity, 400,000 tons) will be added to the existing plants there, and construction works for them are to be finished by October, 1940.

Foundry To Be Built

In the fourth stage, a new foundry will be established at Hirohata, Hyogo Prefecture, with three 700-ton blast furnaces (annual capacity, 700,000 tons), six 120-ton open hearths (annual capacity of steel ingot, 500,000 tons) and rolling plants (annual capacity, 400,000 tons).

The new fifth-stage program contemplates the construction of two 1000-ton furnaces, one 700-ton furnace, and two 500-ton furnaces, the combined capacity of which is estimated at 1,300,000 tons of pig iron a year. Further, 11 120-ton open hearths and three 30-ton mixers (annual capacity of steel ingot, 1,100,000 tons) will be constructed to produce one million tons of rolled steel.

When this and the aforementioned four-stage programs are completed, the Nippon Iron Mfg. Co.'s capacity will be expanded to 6,050,000 tons for pig iron, 5,500,000 tons for steel ingot, and 4,510,000 tons for rolled steel, accounting respectively 87, 56 and 54 per cent of the total output in the country.

Detroit Tool Engineers Meet This Week

MEMBERS of the American Society of Tool Engineers, Detroit section, will hold a dinner meeting Thursday, Dec. 9, at the Chrysler Corp. Highland Park plant. Dean J. J. Caton, of the Chrysler Institute, will answer the query, "Is a College Education Necessary?" A trip through the Chrysler Research Division will be a feature of the meeting.

Meanwhile national officers of the society are preparing plans for a national meeting to be held in March in conjunction with a machine tool show. It is expected that details will be announced at Thursday night's session.

FROM the selection of basic materials to the final inspection of the finished product, T-P Plain Cylindrical Plug Gages — like all other T-P Gages — are made and finished with the care and skill that insures the maximum amount of gaging per dollar of cost. Check the accuracy of your production with Taft-Peirce gages. A new handbook shows the complete line. For your copy, write to the Taft-Peirce Manufacturing Co., Woonsocket, Rhode Island.

USE TAFT-PEIRCE GAGES

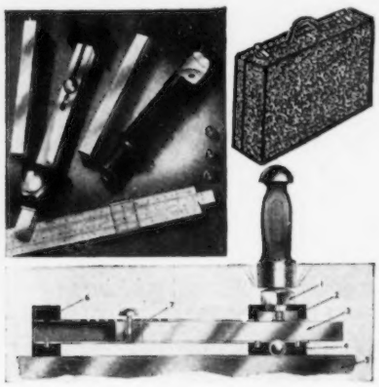
for Every Gaging Need

Telebrineller, A New Hardness Machine

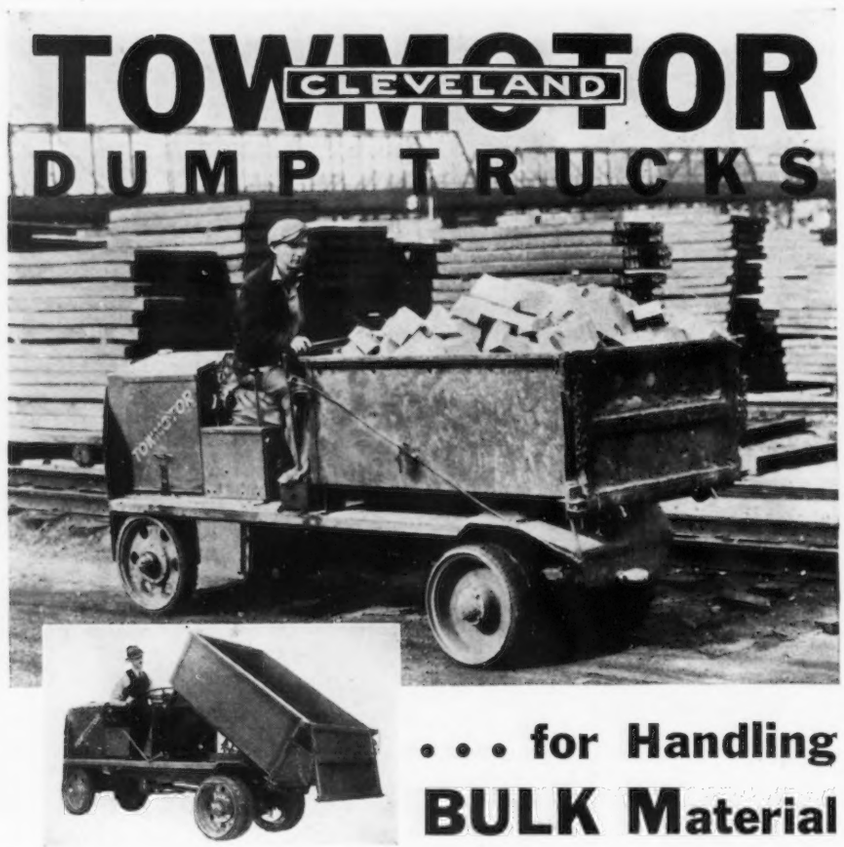
A LIGHT weight, portable Brinell instrument that can be carried easily to any job is said to simplify metal hardness tests in the field, remote from laboratory facilities. According to the manufacturer, Teleweld, Inc., 80 East Jackson Blvd., Chicago, it can be used in close quarters and can be applied to parts and equipment the size of which have, heretofore, made testing difficult, expensive and sometimes virtually impossible. It eliminates both the necessity of dismantling equipment to be tested and transporting specimens to the laboratory.

Known as the Telebrineller, the instrument was developed by one of the oldest and largest railroad rail maintenance organizations in the United States to check and control the re-building (welding) and heat treating of rail ends. Its simplicity, convenience and the ease with which it can be carried are indicated by the fact that the combined weight of the outfit and carrying case is only 6½ lb. According to the manufacturer, it is not affected by hot or cold weather and is built to stand hard use. No training or previous experience, it is claimed, is necessary to operate it accurately.

In addition to its more obvious applications to many types of plants throughout the metallurgic industries where it is used both in receiving rooms to check deliveries of raw materials with specifications ordered and in routine production control, it also has a number of uses in plant maintenance work. Besides its application to test rail ends, it was pointed out, for instance, that it is being used wherever an accurate knowledge of metal hardness is a factor in safety and continuous operation. A number of oil refineries are said to be employing it to test parent metal adjacent to welded joints in alloy steel pipe in high pressure and hot oil lines, heat exchangers, castings,



etc., which welding and vibration in use are claimed to harden beyond the safety point. Tests made at the time of installation and periodically afterward disclose weak points which are annealed in place. This procedure reduces losses and fire hazard, saves time and eliminates tearing out lines and transporting them long distances for tests. The outfit is composed of the Telebrineller instrument proper, a bar of known hardness, a misroscope with a scale etched in its focal plane and a slide rule, packed with extra test bars and impression balls in a small case. The instrument itself as shown in the accompanying illustration, consists of a metal tube supported in a soft rubber head (2) and a rubber spacing block (6), the tube holdng the bar of known hardness (3). An anvil (1) in the top of the rubber head rests directly on the bar. Below the bar an impression ball (4), secured in a narrow aper-



Towmotor dump trucks are built for handling maintenance supplies, bulk material and all sorts of miscellaneous odds and ends that have to be moved about in any manufacturing plant. A dump truck with four wheel stability combined with short turning radius. Narrow width permits movement through small doorways and narrow aisles. Built with the same rugged frame used on Towmotor tractors and lift trucks. Hand operated hydraulic dumping mechanism. Standard capacity, two tons or 30 cubic feet. Maximum gasoline consumption ½ gallon per hour. Write for illustrated bulletin with specifications.

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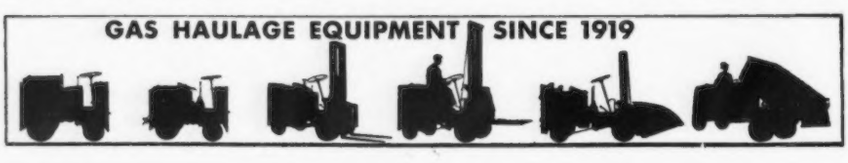

ture in the base of the head comes in direct contact with the metal to be tested. The spacing bar (7) holds the bar in a clear area for each test.

To make a test the instrument is held against the specimen and the anvil is struck a sharp blow with a 3 to 5-lb. hammer. The impact is transmitted through the anvil to the bar, then to the ball and on to the specimen. Force of the blow is said not to be a factor, the diameter of the impression in the bar and in the specimen being, in any case, relative to their individual Brinell hardness number.

The diameters of the impressions are then measured in 1/10 mm. by placing the microscope over each in turn and reading the scale. Figuring the Brinell hardness number is then a simple matter, using either an arithmetical formula or the slide rule.

PERSONAL

THOMAS J. BRAY, JR., has been appointed assistant to vice-president and general manager of sales, Carnegie-Illinois Steel Corp., with offices in Pittsburgh. Mr. Bray, after leaving Lehigh University, was employed by Republic Iron & Steel Co. and Koppers Co., and has been with the Carnegie-Illinois Steel Corp. for the past two years. Mr. Bray, in connection with his new duties, will also continue as assistant manager of sales of the bar, strip and semi-finished materials division of the general sales department in Pittsburgh.

He succeeds LOUIS C. LUSTENBERGER, who has retired after 35 years service with the sales department of Carnegie-Illinois and its predecessors. He served in various capacities, being assigned mostly to special sales responsibilities, building up a remarkable relationship with his trade.

OBITUARY

C. H. CHAMPLAIN, former general works manager, Westinghouse Electric & Mfg. Co., East Pittsburgh, died Dec. 2 at his home in Pittsburgh. Mr. Champlain was employed by Westinghouse for 36 years before his retirement in August, 1934. He went with the Westinghouse company as assistant foreman and in 1903 was made general foreman in charge of the manufacture of all railway transportation rotating equipment. He later was general foreman in the manufacture of industrial generators. In 1919 he was made assistant works manager and four years later went to Sharon, Pa., to supervise construction of a new plant for the manufacture of transformers, remaining to become its first works manager. Mr. Champlain returned to East Pittsburgh in 1931 and became general works manager.

❖ ❖ ❖

WILLIS MCKEE, well known iron and steel works engineer, died at his home in Cleveland, Dec. 4, after a short illness, at the age of 64 years. Mr. McKee was general manager of the Elyria Iron & Steel Co., Elyria, Ohio, now merged with Steel & Tubes, Inc., subsidiary of the Republic Steel Corp. He was a brother of Arthur G. McKee, of Arthur G. McKee & Co., and after leaving the Elyria plant served for some time as superintendent of construction of the McKee company.

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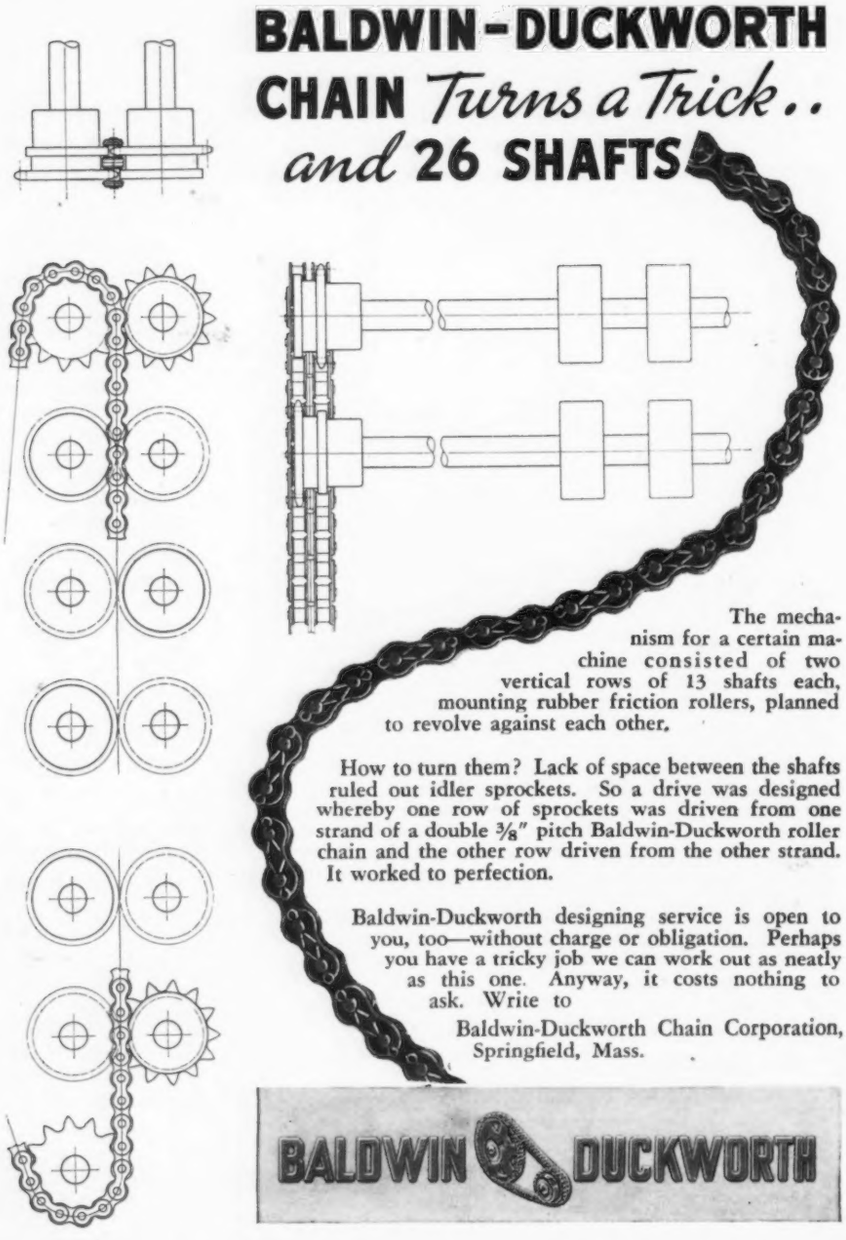
THE TOMKINS-JOHNSON CO.

628 N. Mechanic St., Jackson, Michigan

This Week on the Assembly Line

(CONTINUED FROM PAGE 65)

diesel plant will probably start the wheels going in a week or so on a small scale but it is understood that the complete line of engines will not be produced for a while because many of the final details on one of the designs must be settled yet. * * * An output of 6,000,000 spark plugs a year will be the introductory schedule of the English plant of the Champion Spark Plug Co., according to R. A. Stranahan, Toledo, president of the company. Charles Dewar, production manager of the Toledo plant, installed the machinery and got the new plant into operation in Middlesex, England. * * * Two new industries were announced in the first week of December at Toledo; the Toledo Juvenile Co. will manufacture children's vehicles, toys and other wheeled goods. Tile products will be made by Belmont Products Co., also a new firm. * * * The Binney Castings Co., manufacturers of a special alloy casting for molds in the glass industry, will move into a completely air-conditioned plant now being completed by the Austin Co. * * * Western Cataphote Co. has worked with Eastman Kodak Co. and the Aluminum Corp. in perfecting a new process in the use of reflected light. It has taken over an additional 8000 sq. ft. of space adjoining present quarters. * * * Pure Oil Co. has just completed construction of two combination cracking and topping units at its Toledo refinery at a cost of $2,900,000.



BALDWIN-DUCKWORTH CHAIN *Turns a Trick..* *and* 26 SHAFTS

The mechanism for a certain machine consisted of two vertical rows of 13 shafts each, mounting rubber friction rollers, planned to revolve against each other.

How to turn them? Lack of space between the shafts ruled out idler sprockets. So a drive was designed whereby one row of sprockets was driven from one strand of a double ⅜" pitch Baldwin-Duckworth roller chain and the other row driven from the other strand. It worked to perfection.

Baldwin-Duckworth designing service is open to you, too—without charge or obligation. Perhaps you have a tricky job we can work out as neatly as this one. Anyway, it costs nothing to ask. Write to

Baldwin-Duckworth Chain Corporation, Springfield, Mass.

BALDWIN DUCKWORTH

Steel Window Makers Show Saving By PWA

WASHINGTON, Dec. 7.—The metal window industry, through its trade association, the Metal Window Institute, has released data showing that the average saving in favor of steel casement windows over wood in the PWA housing program of 1935-1937 was $13.40 a room.

This figure, the institute explained, is not merely an "average" of the jobs but has been reduced because of the inclusion of the higher cost of casements on five projects where bidding difficulties were involved.

Basing the estimates on an average of 1.6 windows for each rentable room, the saving per window in favor of steel averaged $8.43 for the entire building program.

Hellstrom Heads Dust Control Association

AT a recent meeting of the Dust Control Equipment Association, Cleveland, John Hellstrom, vice-president, American Filter Co., Louisville, was elected chairman and S. S. Parsons, Parsons Engineering Co., Cleveland, vice-chairman. Arthur J. Tuscany continues as executive secretary and treasurer.

The association announced further progress in its program of developing standards of dust control practice which will be helpful to the purchaser as well as to the manufacturer of dust control equipment. It is cooperating with the Hygiene Codes Committee of the American Foundrymen's Association, Committee Z-9 of the American Standards Association which deals with fundamentals relating to the design and operation of exhaust systems, and also as the aid of the Air Hygiene Foundation.

Republic Steel Corp. has declared a dividend of $1.50 per share on 6 per cent cumulative convertible prior preference stock, series A, for the quarter ending Dec. 31, 1937, payable Dec. 21 to stockholders of record Dec. 13, and a dividend of $13.50 per share on 6 per cent cumulative convertible preferred stock, payable Dec. 21 to stockholders of record Dec. 13. The latter dividend is inclusive of $1.50 rate which has currently been paid and additional $12.00 against accumulations.

Metal Window Makers Agree To FTC Order On Standards

WASHINGTON, Dec. 7.—Clarifying the recent FTC order against members of the industry the Metal Window Institute has revealed that the commission's cease and desist action of last week was not a contested order but was the result of "protracted negotiations and was entered with the consent of all concerned."

The institute said that its original answer to the FTC allegations of trade restriction through price maintenance merely set forth that practices cited had either originated in or had been approved under the NRA code. Later, according to the institute, respondents admitted the allegations of fact named by the commission but disagreed with its conclusions of law.

"The valuable work in furthering the standardization of metal window products, the publication and periodical revision of the industry gross price book and the checking of estimates to detect errors in bidding, are left unmolested by the commission's order," the institute explained.

The 19 member companies which agreed to the issuance of the order and against which the action was brought include the following:

William Bayley Co., Springfield, Ohio; Bliss Steel Products Corp., East Syracuse, N. Y.; Bougert & Carlough Co., Paterson, N. J.; Campbell Metal Window Corp., Baltimore; Ceco Steel Products Corp., Omaha, Neb.; Crittall Mfg. Co., Inc., Washington; Detroit Steel Products Co., Detroit; Druwhit Metal Products Co., Los Angeles; Federal Steel Sash Co., Inc., Waukesha, Wis.; Michael Flynn Mfg. Co., Philadelphia; Hope's Windows, Inc., Jamestown, N. Y.; Kewanee Mfg. Co., Kewanee, Ill.; Mesker Brothers Iron Co., St. Louis; Michel & Pfeffer Iron Works, Inc., San Francisco; S. H. Pomeroy Co., Inc., New York; Soule Steel Co., San Francisco; J. S. Thorn Co., Philadelphia; Truscon Steel Co., Youngstown; and Vento Steel Products Co., Muskegon Heights, Mich.

SECONDS, COUNT NOW IN PRODUCTION

THE speeding up of the production process in the Steel Industry has now reached the point where seconds count for as much as minutes used to. The Continuous Flow Principle of Handling Materials calls for conveyer systems capable of much higher speeds of travel and for automatic and semi-automatic switches, turntables, transfers, tilting and other mechanical handling operations.

Mathews conveyers and auxiliary equipment meet this need most effectively because Mathews engineers have had over 32 years of Continuous Flow experience in many industries, and because Mathews equipment embodies basic (and patented) improvements which anticipate the increasing speed and loads the Steel Industry demands. Processing Equipment installed during 1936-37, embracing the ultimate in design and engineering in the Steel Industry, is illustrated and described in our catalog on Steel Plant Conveyers. Available now.

The leaders in this industry, responsible for 85% of steel production in the United States and Canada, are applying the Continuous Flow Principle of Handling Materials.

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IF WE CAN'T GROW HAIR, WE'LL HIRE IT
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KNOWLEDGE WE POSSESS—SO THAT YOU
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Grammes has been in the business of manufacturing metal products for over 62 years.

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We have consistently served many leading industries in volume production on difficult, exacting and quality specifications.

Consult Grammes about metal products, particularly if they call for craftsmanship and the unusual in finish.

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REINFORCING STEEL

. . . Awards of 6215 tons —4660 tons in new projects.

AWARDS

Providence, R. I., 125 tons, Cocoa-Cola Co. plant, to Truscon Steel Co., Youngstown.

South Boston, 108 tons, Edison plant superstructure, to Northern Steel Co., Boston.

Wellesley, Mass., 110 tons, swimming pool, Wellesley College, to Northern Steel Co., Boston.

New York, 1600 tons, Cypress Avenue grade crossing elimination in Bronx, to Carroll-McCreary Co., Brooklyn.

Baltimore, 700 tons, Sears, Roebuck & Co. store, to Consolidated Engineering Co., Baltimore.

Washington, 800 tons, Mellon Art Museum, to Hudson Supply & Equipment Co., New York.

Washington, 450 tons, Panama Canal, to Carroll-McCreary Co., Brooklyn.

Manitowoc, Wis., 360 tons, Wisconsin Malting Co., to Laclede Steel Co., St. Louis.

Minneapolis, 100 tons, addition to Abbott Hospital, to Cowen & Co., Minneapolis.

St. Cloud, Minn., 100 tons, school, to Cowen & Co., Minneapolis.

Stillwater, Minn., 100 tons, school, to Truscon Steel Co., Youngstown.

St. Paul, 100 tons, State highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.

Fargo, N. D., 100 tons, State highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.

St. Louis, 200 tons, Masonic Home, to Lacelede Steel Co.

Denver, 160 tons, Bureau of Reclamation, to Bethlehem Steel Co.

NEW REINFORCING BAR PROJECTS

New York, 150 tons, Canal Street post office, T. J. Waters Co., New York, low bidder.

Queens, N. Y., 313 tons, lift bridge and Northern Boulevard grade crossing elimination for Bronx-Whitestone bridge, bids Dec. 9.

Middlesex County, N. J., 175 tons, highway bridges.

Bethesda, Md., 600 tons, three buildings for National Institute of Health; bids, Dec. 10.

Cleveland, 275 tons, water mains.

Bay City, Mich., 375 tons, Lafayette Street bridge.

Indianapolis, 130 tons, Indiana Women's prison.

Winona, Minn., 100 tons, junior high school.

Norton, Kan., 375 tons, high school.

Joliet, Ill., 109 tons, grade school; bids in.

Chicago, 170 tons, testing laboratory, Chicago Engineering Works; new bids asked Dec. 9.

Fort Peck, Mont., 1600 tons, dam; Fegles Construction Co., Minneapolis, low bidder on general contract.

Montezuma and Dolores Counties, Colo., 144 tons, five concrete box culverts; Gordon Construction Co., Denver, general contractor.

Gallatin and Flathead Counties, Mont., 141 tons, viaduct and bridge; Thomas Staunton, Great Falls, Mont., general contractor.

Senate Asks Probe of Farm Tool Prices

WASHINGTON, Dec. 7.—Senate debate over a farm relief bill has precipitated demands for an investigation of "high farm equipment prices." Senator Wheeler, Democrat, of Montana, said he had these prices under scrutiny, adding:

"It would act as a powerful stimulant to business generally if we could find out what is holding up farm equipment prices and how they could be lowered."

Senator Borah, Republican, of Idaho, said prices on farm implements have been "rising constantly" because "a monopoly fixed the price." He cited 1935 prices and estimates of 1938 prices on the following items:

A 90-tooth steel harrow was $28.35; will be $31.15.

A 14/16-in. disk harrow was $47; will be $59.50.

A 14-in. two-way sulky plow was $86.50; will be $96.50.

A 5-in. big frame mower, $63; will be $80.25.

A 10/26 S.D. rake with mount wheels, $35.50; will be $42.75; and

A four-wheel sweep rake, $56.25; will be $57.50.

The Federal Trade Commission already has under way a comprehensive investigation of farm equipment costs, distribution methods, prices and any monopolistic practices, including price maintenance or other practices in restraint of trade under a resolution approved by President Roosevelt in June, 1936. The FTC reported to Congress on Nov. 1 that, although lack of funds and personnel had hampered progress on the study, farm machinery manufacturers had furnished "excellent cooperation."

Commission attaches told THE IRON AGE that the inquiry is expected to be completed about March 1.

CIO Asks Bonus Of Allis-Chalmers

CHICAGO, Dec. 7.—Committee for Industrial Organization union members in Allis-Chalmers Mfg. Co.'s plant last week demanded a share of the $6,786,335 profits reported by the company for the first nine months of the year.

The CIO sought part of the company's earnings as a bonus. A wage increase totaling $2,500,000 was given Allis-Chalmers employees in April.

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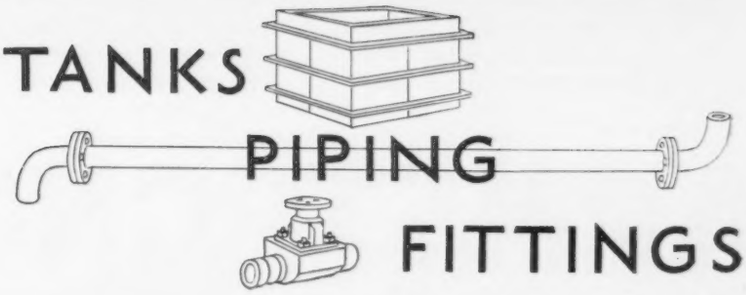

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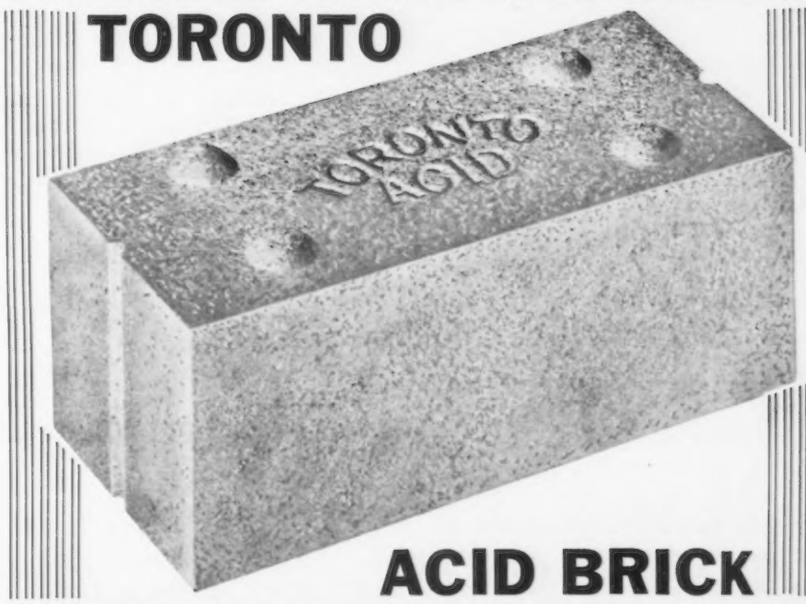

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Welding Stainless and Alloy Steels

By T. R. LICHTENWALTER

*Welding Engineer, Republic Steel Corp., Massillon, Ohio**

IN the past ten years the steel industry has perfected new alloys for those industries demanding materials to withstand high temperatures and extreme corrosive conditions. These have been met to a great extent by the alloys containing chromium or chromium and nickel. The temperature or corrosive condition to be met governs the content of these elements, and to meet certain conditions other elements, such as molybdenum, titanium, columbium and silicon are added.

The high chromium and chromium-nickel alloys of iron are generally known as stainless irons or steels. The stainless alloys can be classed in two groups: first, the straight chromiums, ranging from 11 per cent upwards, which are magnetic, and the chrome-nickel types ranging from 17 per cent chromium and 7 per cent nickel upwards, which are non-magnetic in the annealed state.

The stainless alloys are highly resistant to most acids which are oxidizing in their nature, but reducing acids such as sulphuric and hydrochloric will attack them readily. They are resistant to oxidation and scaling at high temperatures and also retain their high physical properties at elevated temperatures.

For these reasons they are meeting increased demand each year in the chemical, oil, textile, automotive, food, dairy and many other industries requiring a material with unusual corrosion- and heat-resisting qualities. Stainless steels are supplied in plates, sheets, bars, strip, tubing, bolts, nut, rivets, wire and many other shapes obtainable in common steel. They can also be rolled, drawn or formed into almost any shape or part as required by the fabricator, if proper procedures are followed.

If it were not possible to weld the stainless alloys, their present wide and diversified use would not be possible. Both the straight chromium and the austenitic chrome-nickel types are weldable. The straight chromium types are brittle in the as-welded condition. However, the austenitic types are very ductile in the as-welded condition.

As this paper covers the oxy-acetylene process of welding, the

*Read before the 38th Annual Convention of the International Acetylene Association, Birmingham, Ala., Nov. 10, 11, 12, 1937.

ARMSTRONG
Drop Forged
WRENCHES

With 51 types always in stock . . . all millings, all sizes from tiny miniatures to great 2-man wrenches . . . there are standard ARMSTRONG WRENCHES readily available to meet any normal industrial requirement. And, for those special demands, call for special wrenches and special millings, an ample stock of forged wrench blanks is maintained to assure delivery on short notice.

ARMSTRONG Wrenches are quality wrenches drop forged from special analysis steel, improved in designs, in proportions and balance. They are heat treated, hardened and finely finished in black baked enamel with heads ground bright and plainly marked for size. They are stronger, finer tools, still cost no more than other quality wrenches.

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"The Tool Holder People"
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51 STANDARD TYPES with openings milled for . . .
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H & K industrial perforations embrace a range of sizes and shapes intended to meet the most exacting requirements of all industries.

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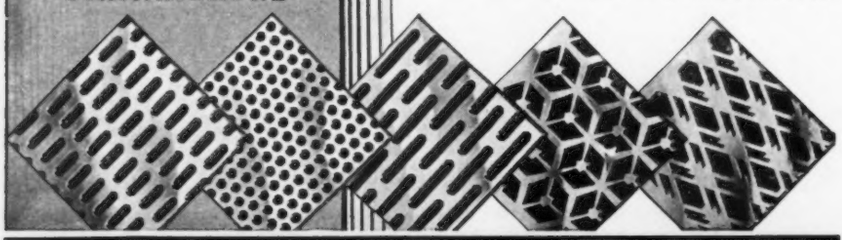
ANY METAL - ANY PERFORATION



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straight chromium steels will be discussed first. Due to the low ductility in the as-welded condition, we must first look to the design of the part to be fabricated and lay out the joints where they will be subjected to the least stress. It may also be well to mention that this is a good procedure to follow on any job being designed for welding fabrication. Many of us in the past have been shown blue prints of a part which the designer could conceive no way to assemble. Apparently he just penciled an arrow with the note "weld" and when the job came to the welding department, the remark might be heard "Rube Briteman must be on the loose again" and, much to everybody's surprise, the assembly would be made. Of course, we cannot mention what the operator said and some of the contortions he went through would have made a human frog violently jealous.

The physical properties of the straight chromium alloys are fairly comparable and the following is typical of a 16-18 per cent chromium containing 0.12 maximum carbon in the annealed condition.

Tensile strength	75,000 lb. per sq. in.
Elastic limit	50,000 lb. per sq. in.
Elongation in 2 in.	25.0 per cent
Reduction of area	60.0 per cent
Hardness of Brinell	160
Thermal conductivity	60 per cent that of mild steel
Coefficient of expansion	0.0000096 - O — 100 deg. C.

From this it may be understood that both the thermal conductivity and the coefficient of expansion are somewhat less than steel, and the job can be laid out using almost the same procedure as for steel. The lower heat conductivity will be found to give some trouble due to the warpage in the lighter gages, but this can be taken care of by proper design of joints and the use of welding fixtures.

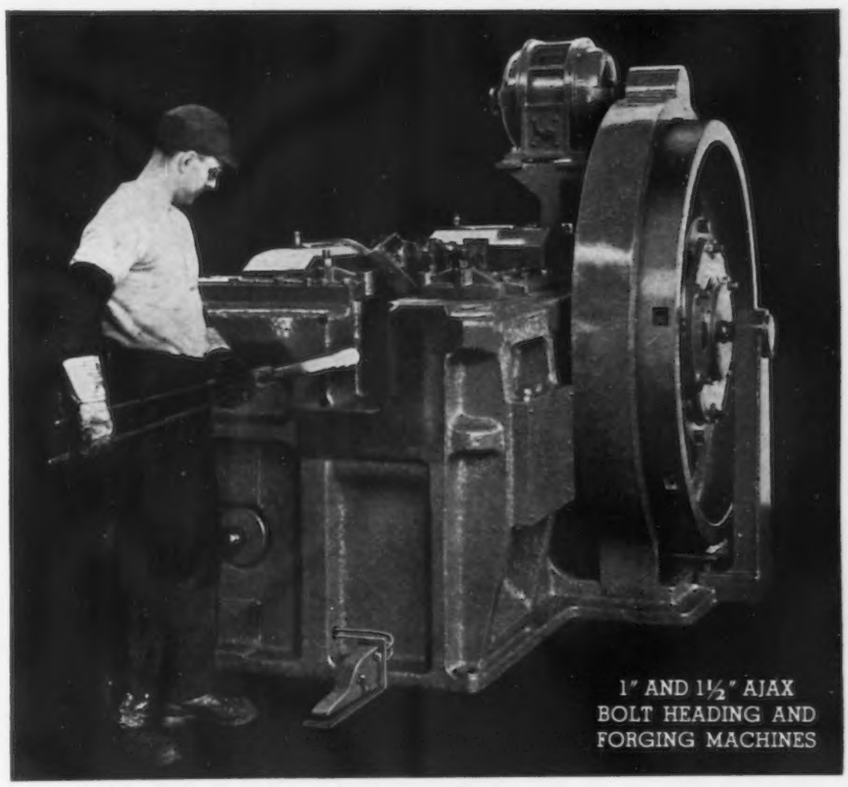
Spacing of Tack Welds

The writer most generally spaces the joints about the thickness of the gage and uses 18-8 chrome-nickel type welding rod for tacking. The frequency of these tack welds depends on the length and type of welded joint to be made, and in some assemblies are as close as every inch. After tacking, the back side of the joints are fluxed and the weld finished by using the same type of filler rod as the sheet or assembly being made.

If it is possible to peen the weld while still hot, the ductility of the weld joint can be improved, and if followed by an anneal, much more ductility can be attained. Annealing the fabricated part is not always feasible, but will increase the ductility especially the alloys under 14 per cent chromium.

The straight chromium types being generally used for elevated temperatures and for corrosive conditions of the lesser nature very seldom require annealing after welding except when used for nitric acid. If the equipment is to be used for nitric acid, the article must be annealed before putting into service.

Now we will take up the welding of the austenitic chrome-nickel types which are most readily welded and possess great ductility in the as-welded state. The physical properties again are comparable to



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● For high production on bolts and similar straight upset forgings and extreme accuracy on intricate, thin walled, deep pierced forgings, these machines far surpass any of their type heretofore available to the production industry.

Air clutch driven and designed along the same lines as our large machines, they possess the same operating advantages. Write for our detailed descriptive bulletin No. 64.

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EUCLID BRANCH P. O. CLEVELAND
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AJAX

the 18 chrome-8 nickel type as follows.

Tensile strength	85,000 lb. per sq. in.
Elastic limit	40,000 lb. per sq. in.
Elongation in 2 in.	50 per cent
Reduction of area	65 per cent
Hardness Brinell	140
Thermal conductivity	.40 per cent that of mild steel
Coefficient of expansion	.000016 0—100 deg. E.

Here you will note we have considerably lower heat conductivity and a higher coefficient of expansion than in mild steel. These two characteristics are poison to the operator who is not familiar with this type of alloy, but it is surprising to know how well he can control warpage if he understands the game and is willing. The design of the joint is a deciding factor, and where it is not possible to design to control warpage, fixtures are a necessity.

Here again the writer generally spaces the thickness of the gage and uses numerous tacks, followed by fluxing, the back side, proceeds with the weld.

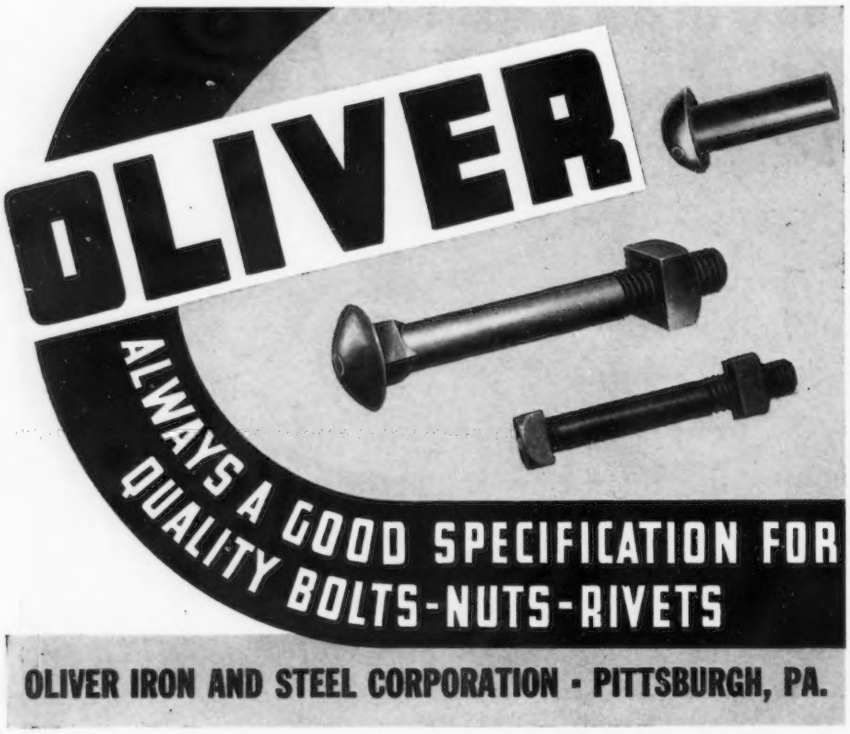
In some instances, where only a short weld is to be made, say up to 6 in., the job is spaced the thickness of the gage at the start, and a little over ¼ in. per ft. spacing is used to take care of expansion. It is well to tack the end first, start the weld at the open end, then proceed in the direction of the tack. If this is not done, you may find yourself looking at a space twice as wide as you had originally allowed for or just the reverse. Chrome nickel types of stainless due to the aforementioned peculiarities of physical properties must have the weld laid down in a uniform manner. The speed should not be too fast, as this will generally close the gap, whereas too slow a speed opens it. The amount of heat is also a governing factor, excessive heat tending to increasing gap and also lays down an excess of the required amount of weld metal.

The actual welding operations for both types of stainless are practically the same. Equipment should be in good condition, the regulators should maintain an even flow of gases and the blowpipe should be capable of delivering a uniform flame.

As stainless materials melt at a lower temperature than mild steel and also have lower conductivity, a welding tip with an orifice one to two sizes smaller should be selected rather than that used for the same thickness of mild steel. The flame should be adjusted so as to show a slight excess of acetylene, 1/32 to 1/16 in. of acetylene feathers will be found to give best results. This adjustment will not carburize weld metal excessively and will maintain a reducing atmosphere over the molten pool, preventing the oxidation of the chromium.

As previously mentioned, the back side is fluxed, using specially prepared flux. This flux, as the weld proceeds, forms an envelope preventing oxidation of chromium at this point, thus enabling the operator to obtain full and uniform penetration of the weld metal throughout the joint.

Bare welding rods are best



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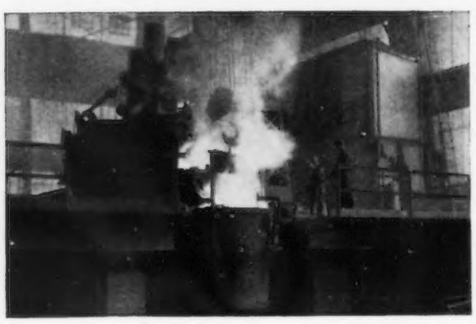

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suited for oxy-acetylene welding and should be kept out of the welding cone of the flame and brought in for metal addition only when needed, but still keeping it protected in reducing atmosphere of flame envelope. This will protect the end of the rod from being oxidized. Some operators remove the end of the welding rod completely out of the envelope. This can be done by those operators who understand the peculiarities of molten stainless by making sure the end of rod is not molten before removing from flame. The weld should proceed with very little puddling, the tip of the welding cone almost touching the molten pool. The joint can be knit together by a back and forth motion. However, the round and round motion so often used for welding mild steel will give a spongy weld, which often will not be noticed until after the fabricated article is in service.

Most operator's difficulties come at the end of a weld due to a deep crater or hole all the way through the seam. They also have the same trouble when patching or spotting leaks. This can be readily overcome at the end of a seam by running out on the end of the welding rod.

In the comparatively short time stainless materials have been produced on a commercial scale, their uses and applications have grown rapidly. Considerable welding data are at hand and this resource should be drawn on by those already involved in the problem of welding stainless steel as well as by those contemplating the fabrication of stainless alloy articles.

Navy Awards 19,019 Tons For Two Ships

WASHINGTON, Dec. 7.—The Navy Department today awarded 19,019 tons of steel for the battleships *North Carolina* and *Washington*, building at the Brooklyn and the Philadelphia navy yards.

Plate awards which totaled 14,950 tons were distributed as follows: Carnegie-Illinois Steel Corp., 4167 tons; Central Iron & Steel Co., Harrisburg, 6690 tons; Lukens Steel Co., Coatesville, Pa., 2560 tons; Joseph P. Cattie & Brothers, Philadelphia, 83 tons; Worth Steel Co., Claymont, Del., 1450 tons.

Board Fixes Higher Coal Prices Effective Dec. 16

WASHINGTON, Dec. 7.—While the President continues his search for ways of reducing prices and cracking down on so-called monopolistic practices which he contends go hand in hand with high prices, the soft coal board has established a mandatory selling monopoly in the bituminous industry and pegged prices substantially higher.

The fixed prices, which become

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No. 5 Size
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Abroad, They Do It More Painlessly

By JOHN H. VAN DEVENTER

IN some of the overseas countries, where dictatorship has frankly replaced democracy, an editor knows what to expect if he should criticize an official of the government. He is not kept in suspense; the results are sudden and comparatively painless. Whether the government or the publisher or the editor's estate pays the funeral expenses, the cost is moderate.

In this land of the free and the brave, where some say Democracy had its birthplace and others that it has had its interment, a more refined though painful treatment of critics has been evolved. It is patterned after the ancient oriental torture of "a thousand deaths" or the somewhat later improvements added to it by the native American Indians.

It has remained, indeed, for our political omnipotents of the present day to go the orientals and the Indians one better in dealing with those who have incurred their displeasure. In the modern technique of persecution, the subpeona has replaced the finger nail pincers, the ignited splinter or the fire stake.

The subpeona, of course, is a recognized and time honored instrument of jurisprudence. In the hands of our courts of law, where it has been properly used, it is an invaluable aid to justice. In the hands of non-judicial bodies with biased, bigoted or partisan objectives, it has become a dangerous weapon inimical to public welfare and democratic principles.

Through the use of subpeona power, say by one of the many alphabetical agencies created under the New Deal, a critic may be haled before it, compelled to engage legal aid at great expense, moved from place to place or from court to court, bled white financially in an unfair competition with Uncle Sam's inexhaustible pocketbook and eventually ruined even though finally a victor in the court of last resort.

Latest glaring example of what can happen to a critic of bureaucratic procedure is the subpeonaing of Hartley W. Barclay, able editor of *Mill and Factory,* by the National Labor Relations Board, because of an article by him adverse to the board's handling of the Weirton Steel hearings.

Hartley Barclay is not a man who jumps at conclusions. He spared neither time nor shoeleather to unearth the facts in the Weirton case. That many of the facts he dug up would have been less odorous if they had remained buried is not his fault. He made them public as an act of public service.

It goes without saying that Barclay will "lick" the Labor Board in the long run. If he does not, the days of the free press in America are over. But in the meantime, his publishers will be penalized by unrecoverable legal costs, as are all employers who are haled before bureaucratic inquisitors, armed with unlimited powers of persecution. This is **not** American fair play.

(CONTINUED FROM PAGE 109)

effective Dec. 16, are described by the Commission as "somewhat higher" than prevailing rates and are based on the weighted average costs of $2.15 per net ton in the heavy producing areas radiating from Pennsylvania and West Virginia; $1.79 in Western Kentucky, Illinois, Indiana and Iowa fields, and $2.55 in the Southwestern coal mines.

Prices fixed for steam grades, such as mine run, nut and slack, ranged from 5c. to 20c. a ton higher than had been proposed by the industry. Seeking to allay the fears of soaring prices among the household consumers, who constitute the bulk of voters, the board reduced prices on domestic coal from 5c. to 15c. below the rates suggested by producers.

Estimates varied widely but experts said that industrial consumers, which use about 80 per cent of the country's soft coal production, will pay from $40,000,000 to $300,000,000 more for coal annually under the Commission's new price schedules.

Price increases will amount to as much as $1.10 per ton on certain kinds and sizes under the new price schedules, although increases will not be uniform as between districts. In western Pennsylvania mines, however, mine run coal currently quoted at around $2.15 per net ton f.o.b. mines will range from $2.05 to $2.80 under the Commission's schedules; slack now being quoted at from $1.25 to $1.45 is listed at $1.75 to $2.55 f.o.b. mines under the minimum price schedule.

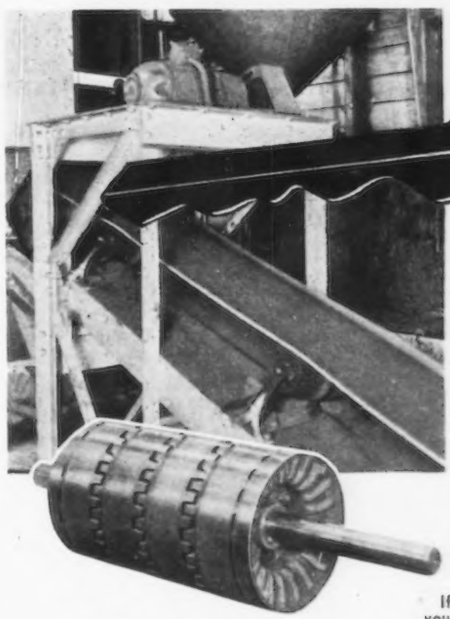
Railroad fuel, reportedly a center of controversy for months within the Commission, was the only coal given a "use" classification in the published schedule. Prices for railroad coal ranged from $1.95 to $3.55 which, according to the Commission's statement, are "in line with the cost of production."

Public Hearing Asked

Meanwhile, the Commission's own consumers' counsel has reiterated his complaint that the coal board has thus far failed to supply him with the data on which the prices are based. Representing both industrial and domestic consumers, John Carson, counsel, asked the Commission for a public hearing to allow some 300 representatives of consumer groups who are concerned with the new prices.

Commission tactics have held the spot light for months and have been the subject of three demands for Congressional investigation of activities. One request, in the form of a Senate resolution introduced by Senator Davis, Republican, of Pennsylvania, is being considered by a sub-committee of the Senate Interstate Commerce Committee headed by Senator Minton, Democrat, of Indiana. Democrats and Republicans alike have been severely critical of Commission functions, and have pointed out that an investigation would contribute immeasurably to public enlightenment.

Still undecided at the time minimum prices were announced was the question of captive mine status. Applications seeking exemption from the coal code have been pending before the Commission for months and only the Wheeling Steel Corp. case has been passed upon.



The Key to better Castings

Many foundries have overlooked the key to better castings. Michigan Malleable Iron Co., found the key when they installed a Dings Magnetic Pulley on their foundry sand conveyor. Sprues, risers, gaggers, nails, shot iron, the stuff that spoils castings, are being entirely eliminated, resulting in a reduction in rejects and imperfections. Sand is used over and over without trouble.

Dings pulleys are scientifically correct. Individual coil spools, bronze spacers, bronze coil covers, corrugated radial openings, longitudinal openings and heat radiating vanes are advantages that are found only in Dings. It's the pulley that produces the most magnetic pull for every unit of electrical energy expended, and provides cooler operation with no power decrease through overheating.

If you think your casting failures are excessive, if you're looking for the key to better castings, let a Dings engineer work with you in checking the trouble under no obligation to you.

Dings High Intensity MAGNETIC SEPARATION

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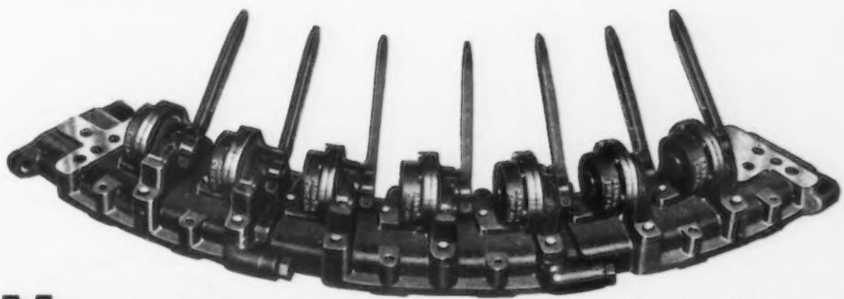

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FABRICATED STEEL

. . . Lettings in better volume at 16,750 tons compared with 11,750 tons last week.

o o o

. . . New projects decline to 11,200 tons from 14,000 tons a week ago.

o o o

. . . Plate awards only 450 tons.

NORTH ATLANTIC STATES

Lisbon, Me., 150 tons, mill building, to Lyons Iron Works, Manchester, N. H.

Providence, R. I., 300 tons, Coca-Cola Co. plant, to James H. Tower Iron Works, Providence.

New York, 360 tons, Museum of Modern Art addition, to American Bridge Co., Pittsburgh.

New York, 1600 tons, Cypress Avenue grade crossing elimination in Bronx, to American Bridge Co., Pittsburgh.

New York, 1150 tons, apartment building, 35th Street and Madison Avenue, to Harris Structural Steel Co., Plainfield, N. J.

Brooklyn, 160 tons, J. Eichler Brewing Co. grain storage building, to Voepel Sons, Inc., New York.

Queens, N. Y., 120 tons, Linden Street bridge, Triboro Bridge Authority, to Bethlehem Steel Co., Bethlehem, Pa.

Apalachin, N. Y., 120 tons, State bridge RC-3911, to Lackawanna Steel Construction Corp., Lackawanna, N. Y.

Buffalo, 170 tons, main building, sewage disposal plant, to Bethlehem Steel Co., Bethlehem, Pa.

Buffalo, 500 tons, addition to William Hengerer department store, to R. S. McMannus Steel Construction Co., Buffalo.

Englewood Cliffs, N. J., 270 tons, novitiate, Sisters of St. Joseph, to F. G. Schaefer Iron Works, Edgewater, N. J.

THE SOUTH

Morgantown, W. Va., 125 tons, Montgomery Ward store, to Ingalls Iron Works Co., Birmingham.

Abbeville, La., 850 tons, bridge, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

CENTRAL STATES

St. Mary's, Ohio, 140 tons, highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.

Bay City and Essexville, Mich., 3000 tons, power houses for Consumers Power Co., to an unnamed fabricator.

Dearborn, Mich., 5150 tons, tool and die shop for Ford Motor Co., to Bethlehem Steel Co., Bethlehem, Pa.

Lawrenceburg, Ind., 150 tons, still house, to Louisville Bridge & Iron Co., Louisville, Ky.

Mundelein, Ill., 190 tons, bridge for Minneapolis, St. Paul & Sault Ste. Marie Railroad, to Milwaukee Bridge Co., Milwaukee.

Peoria, Ill., 116 tons, Illinois River dam to Lakeside Bridge & Steel Co., Milwaukee; American Car & Foundry Co., Chicago, and others.

Emerson, Iowa, 440 tons, State highway bridge, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Burlington, Iowa, 425 tons, J. I. Case Co. warehouse, to Rock Island Bridge & Iron Works, Rock Island, Ill.

Milwaukee, 400 tons, Pulaski High School, to Milwaukee Bridge Co., Milwaukee.

Alma, Wis., 150 tons, tainter gate hoists, locks 4 and 5, Mississippi River improvement, to Lakeside Bridge & Steel Co., Milwaukee.

Racine, Wis., 185 tons, tractor plant, to Lakeside Bridge & Steel Co., Milwaukee.

Brookings County, S. D., 230 tons, two bridges, to Bethlehem Steel Co., Bethlehem, Pa.

WESTERN STATES

Colorado Springs, Colo., 270 tons, State bridge, to Kansas City Structural Steel Co., Kansas City, Kans.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Belmont, Mass., 100 tons, school.

Bangor, Me., 140 tons, approach spans, Presque Isle bridge, Bangor & Aroostook Railroad.

Norwich, Conn., 400 tons, Shetucket River State bridge.

Queens, N. Y., 2560 tons, lift bridge and Northern Boulevard grade crossing elimination for Bronx-Whitestone bridge, two contracts, WB-18 and WB-19; bids Dec. 9.

Bay Shore, N. Y., 570 tons, high school. Union Free School District No. 1.

Hartsdale, N. Y., 170 tons, school, Union School District No. 7.

Elba, N. Y., 150 tons, centralized school; C. H. Wing & Co., Buffalo, low bidder on general contract.

Vestal, N. Y., 600 tons, school; O'Connell Co., Binghamton, N. Y., low bidder on general contract.

Farrell, Pa., 240 tons, high school.

Warren, Pa., 100 tons, addition to hospital; bids taken Dec. 7.

Elizabethtown, Pa., 100 tons, hospital; bids taken Dec. 7.

State of New Jersey, 175 tons, bridge on route 25, section 3C; bids Dec. 20.

Middlesex County, N. J., 350 tons, highway bridges.

Perth Amboy, N. Y., 200 tons, State bridge.

THE SOUTH

Sylvania, Ga., 200 tons, bridge.

Malcolm, Ala., 325 tons, bridge.

Houston, Tex., 300 tons, building.

Sun Ray, Tex., 200 tons, power plant, Panhandle Power & Light Co.

CENTRAL STATES

Kalamazoo, Mich., 274 tons, bridge, Consumers Power Co.

Corydon, Ind., 204 tons, bridge.

State of Indiana, 315 tons, bridges.

Brighton, Ohio, 150 tons, bridge No. 38.

Ross County, Ohio, 240 tons, Paint Creek bridge.

Crowell, Neb., 190 tons, State highway viaduct.

LaCrosse, Wis., 3100 tons, superstructure, Mississippi River Bridge, Klug & Smith Co., Milwaukee, low bidder on general contract at $509,620.

WESTERN STATES

Glendale, Cal., 200 tons, telephone building.

Mare Island, Cal., 1600 tons, cofferdams, dry dock.

Los Angeles, 133 tons, Geneva Street bridge for United States Engineer; Consolidated Steel Corp., Los Angeles, low bidder.

Los Angeles, 115 tons, West Brand Boulevard bridge for United States Engineer; Consolidated Steel Corp., Los Angeles, low bidder.

Los Angeles, 158 tons, Duquesne Avenue bridge for United States Engineer; bids opened.

Los Angeles, 235 tons, Pacific Electric Co. bridge over Los Angeles River; bids Dec. 15.

Astoria, Wash., 250 tons, Gray River State bridge.

Skykomish, Wash., 248 tons, highway bridge; Neukirch Brothers, Seattle, general contractors.

Wahkiakum County, Wash., 220 tons, highway bridge; Mirene Co., Portland, Ore., general contractor.

South Bend, Wash., 220 tons, bridge.

Grant County, Ore., 184 tons, highway bridge; Leonard & Slate, Multnomah, Ore., general contractors.

Gallatin and Flathead Counties, Mont., 433 tons, viaduct and bridge; Thomas Staunton, Great Falls, Mont., general contractor.

FABRICATED PLATES

AWARDS

Alabama and Tennessee, 350 tons, seven tanks for Gulf Oil Corp., to Chattanooga Boiler & Tank Co., Chattanooga, Tenn.

Reedsville, Wis., 100 tons, elevated steel tank, to Chicago Bridge & Iron Works, Chicago.

SHEET PILING

AWARDS

Buffalo, 250 tons, sewage disposal plant, to Carnegie-Illinois Steel Corp., Pittsburgh.

Pig Iron Output Drops 28%; Nov. Rate at 20-Month Low

PRODUCTION of coke pig iron in November dropped to 2,006,724 gross tons from 2,892,629 tons in October. The loss in the daily rate amounted to 28.3 per cent, or from 93,311 tons in October to 66,891 in November. The daily rate last month was the lowest since March, 1936, when it stood at 65,816 tons.

There was a net loss of 38 furnaces making iron on Dec. 1, the 113 operating at 58,965 tons daily, against 151 on Nov. 1, producing 83,850 tons daily. Forty furnaces were blown out or banked and two furnaces were put in blast. The United States Steel Corp took 11 off blast and put two in operation. Independent producers took 20 off blast and merchant producers blew out or banked nine units.

Among the furnaces blown out or banked were the following: One Duquesne, three Edgar Thomson, one Ohio, two Gary, of the Carnegie-Illinois Steel Corp.; two Monongahela, two Lorain, National Tube Co.; three Cambria, two Lackawanna, one Steelton, Bethlehem Steel Co.; one Donner, one Haselton, one River, one Betty, one Gulfsteel, and one Pioneer, Republic Steel Corp.; one Susquehanna, National Steel Corp.; one Eliza, Jones & Laughlin Steel Corp.; one Monessen, Pittsburgh Steel Co.; one Ashland, American Rolling Mill Co.; one Jeannette and one Iroquois, Youngstown Sheet & Tube Co.; two Madeline, Inland Steel Co.; one Colorado, Colorado Fuel & Iron Co.; one Swede, Alan Wood Steel Co.; one Shenango, Shenango Furnace Co.; one Portsmouth, Wheeling Steel Corp.; one Zenith, Interlake Iron Corp.; one North Birmingham, Sloss-Sheffield Steel & Iron Co.; one Woodward Iron Co. furnace; one Mystic Iron Works furnace, and the Colonial Iron Co. furnace.

The two furnaces put in blast were a Mingo unit of the Carnegie-Illinois Steel Corp., and a Fairfield unit of the Tennessee Coal, Iron & Railroad Co.

Daily Average Production of Coke Pig Iron

Gross Tons

	1937	1936	1935	1934	1933
January	103,597	65,351	47,656	39,201	18,348
February	107,115	62,886	57,448	45,131	19,798
March	111,596	65,816	57,098	52,243	17,484
April	113,055	80,125	55,449	57,561	20,787
May	114,104	85,432	55,713	65,900	28,621
June	103,584	86,208	51,570	64,338	42,166
½ year	108,876	74,331	54,138	54,134	24,536
July	112,866	83,686	49,041	39,510	57,821
August	116,317	87,475	56,816	34,012	59,142
September	113,679	91,010	59,216	29,935	50,742
October	93,311	96,512	63,820	30,679	43,754
November	66,891	98,246	68,864	31,898	36,174
December	.....	100,485	67,950	33,149	38,131
Year	.....	83,658	67,556	43,592	26,199

Production of Coke Pig Iron and Ferromanganese

Gross Tons

	Pig Iron*		Ferromanganese†	
	1937	1936	1937	1936
January	3,211,500	2,025,885	23,060	24,766
February	2,999,218	1,823,706	24,228	24,988
March	3,459,473	2,040,311	27,757	22,725
April	3,391,665	2,403,683	26,765	19,667
May	3,537,231	2,648,401	34,632	18,363
June	3,107,506	2,586,240	34,415	17,549
½ year	19,706,593	13,528,226	170,857	128,058
July	3,498,858	2,594,268	23,913	20,205
August	3,605,818	2,711,721	29,596	20,658
September	3,410,371	2,730,293	26,100	15,919
October	2,892,629	2,991,887	26,348	19,805
November	2,006,724	2,947,365	25,473	24,368
December	.....	3,115,037	.....	25,715
Year	.....	30,618,797	.....	254,728

*These totals do not include charcoal pig iron.
†Included in pig iron figures.

Merchant Iron Made, Daily Rate

Tons

	1937	1936	1935	1934	1933
January	16,106	10,537	3,926	7,800	2,602
February	16,514	11,296	6,288	7,071	2,863
March	16,457	10,831	7,089	7,197	2,412
April	14,517	13,897	8,799	8,838	1,908
May	19,483	12,814	8,441	9,099	3,129
June	15,870	14,209	7,874	9,499	4,088
July	19,609	11,619	8,644	7,880	6,783
August	17,381	12,148	8,194	6,043	7,756
September	20,065	12,526	10,090	4,986	10,034
October	18,950	13,645	11,199	5,765	8,634
November	15,662	14,739	12,503	6,610	7,639
December	....	14,852	13,312	4,399	8,358

Production by Districts and Coke Furnaces in Blast

Furnaces	(Gross Tons) Production: November (30 Days)	(Gross Tons) Production: October (31 Days)	Dec. 1: Number in Blast	Dec. 1: Operating Rate, Tons a Day	Nov. 1: Number in Blast	Nov. 1: Operating Rate, Tons a Day
New York:						
Buffalo	148,668	240,215	7	3,720	11	7,245
Other New York and Mass.	40,597	39,276	2	760	3	1,265
Pennsylvania:						
Lehigh Valley	53,531	73,896	5	1,785	5	2,135
Schuylkill Valley	32,966	39,316	2	890	3	1,235
Susquehanna and Lebanon Valleys	19,306	30,705	1	470	2	990
Ferromanganese	.....	.....	0	.....	0	.....
Pittsburh District	308,370	518,736	17	8,665	25	14,260
Ferro. and Spiegel	17,240	23,911	2	575	2	770
Shenango Valley	29,287	39,658	1	650	2	1,275
Western Pennsylvania	59,608	106,084	3	1,105	7	3,420
Ferro. and Spiegel	12,052	11,144	2	400	2	360
Maryland	103,925	127,432	4	3,465	4	3,920
Wheeling District	121,375	134,818	7	4,045	6	4,550
Ohio:						
Mahoning Valley	199,768	264,357	9	5,385	12	6,925
Central and Northern	160,914	284,166	10	4,815	14	8,170
Southern	28,530	42,373	3	950	4	1,180
Illinois and Indiana	352,776	527,334	16	11,465	21	13,590
Michigan and Minnesota	89,581	99,757	5	2,950	6	3,220
Colorado, Missouri and Utah	23,813	21,624	1	395	2	700
Ferromanganese	.....	.....	0	.....	0	.....
The South:						
Virginia	.....	.....	0	.....	0	.....
Ferromanganese	2,918	3,100	1	95	1	100
Kentucky	13,914	26,513	1	415	2	855
Alabama	187,028	238,214	13	5,910	17	7,685
Ferro. and Spiegel	557	.....	1	55	0	.....
Tennessee	.....	.....	0	.....	0	.....
Total	2,006,724	2,892,629	113	58,965	151	83,850

COMING CONVENTIONS

Dec. 6 to 11—Society for the Advancement of Management, Hotel New Yorker, New York. Headquarters of the society is at 29 West 39th Street, New York.

Dec. 6 to 11—Exposition of Chemical Industries, Grand Central Palace, New York.

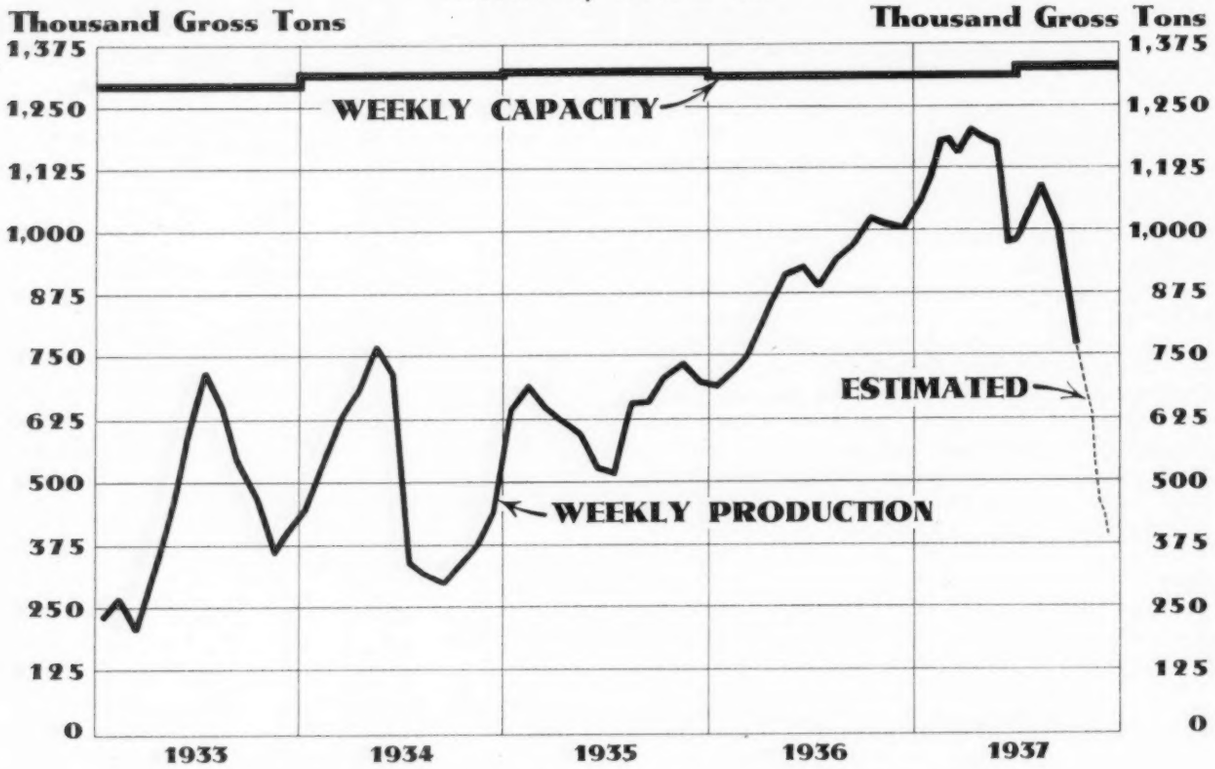
Jan. 12 to 14—Institute of Scrap Iron and Steel, Ambassador Hotel, Atlantic City, N. J. B. H. Rubine, Hudson Iron & Metal Co., Bayonne, N. J., is in charge of arrangements.

Jan. 24 to 28—International Heating and Ventilating Exposition, Grand Central Palace, New York.

High Speed Hammer Co., Inc., Rochester, N. Y., has recently appointed Dowding & Doll, Ltd., Greycoat Street, Westminster, London, S.W. 1, England, as its exclusive representative on the full line of high-speed riveting hammers and tools for the British Isles. Dowding & Doll, Ltd., will also sell the high-speed precision drilling machine, Model R-53.

PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1937



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

	Current Week	Last Week
Pittsburgh	24.0	25.0
Chicago	24.0	30.0
Valleys	29.0	28.0
Philadelphia	30.0	34.0
Cleveland	31.0	31.0
Buffalo	21.5	21.5
Wheeling	44.0	56.0
Southern	37.5	46.0
Ohio River	6.0	22.0
Western	55.0	55.0
St. Louis	29.0	19.0
Detroit	46.0	46.0
Eastern	40.0	40.0
Aggregate	27.5	30.0

Weekly Booking of Construction Steel

	Week Ended				Year to Date	
	Dec. 7, 1937	Nov. 30, 1937	Nov. 9, 1937	Dec. 8, 1936	1937	1936
Fabricated structural steel awards	16,750	11,750	35,000	14,600	987,335	988,205
Fabricated plate awards	450	2,275	14,120	4,350	111,065	209,725
Steel sheet piling awards	250	1,200	20,000	0	63,815	53,970
Reinforcing bar awards	6,215	950	8,600	2,965	279,875	317,795
Total Lettings of Construction Steel	23,665	16,175	77,720	21,915	1,442,090	1,569,695

. . . .SUMMARY OF THE WEEK. . . .

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. . . Signs appear of a moderate change in steel situation.

° ° °

. . . Steel scrap strengthening; composite price rises slightly.

° ° °

. . . Orders placed for about 100,000 tons of rails and some equipment.

ALTHOUGH steel ingot production has declined for the twelfth consecutive week, from 80 per cent in the week beginning Sept. 13 to 27½ per cent this week, there are increasing signs of a turn in the situation which may not be fully apparent until the December inventory period is past.

The usually sensitive scrap market is beginning to feel this change even without the stimulus of steel mill buying. Not only have declines been checked in most markets, but some advances have occurred, notably at Philadelphia, where export buying coupled with some mill purchases has brought a rise of 50c. a ton, and the Pittsburgh and Chicago levels on No. 1 heavy melting steel are unchanged for the third consecutive week. While the ordinary grade of melting steel has not advanced at Pittsburgh, the railroad grade has gone up an average of 75c. a ton. Dealers bids on automobile scrap at Detroit were above the recently quoted prices. THE IRON AGE, scrap composite price has advanced to $13.08 from $12.92 after an uninterrupted drop from $20.58 in the third week of August.

Railroad orders are conspicuous in an otherwise quiet market. Orders for about 100,000 tons of rails have been placed within the week—40,000 tons by the Southern Pacific, 30,000 tons by the Northern Pacific, 20,000 tons by the Western Pacific, 5000 tons by the Kansas City Southern and 2836 tons by the Central of Georgia. The St. Louis-San Francisco has asked court permission to spend $1,072,827 for rails and track supplies and nearly $1,000,000 additional for car and locomotive repairs and shop tools. The Santa Fe has expended $4,800,000 for 43 stainless steel cars and seven diesel locomotives and the Western Pacific has ordered 400 freight cars. The Chesapeake & Ohio, Erie and Nickel Plate roads will come into the market for rails in January.

While steel buying generally is still at the stagnation point, there is some encouragement in the fact that a leading Chicago producer had the largest orders in eight weeks. Some of the current business will not be shipped until first quarter. Indications continue to point to a moderate rise in production by mid-January.

Output of open-hearth and bessemer ingots in November totaled 2,153,781 tons, equal to only 38.22 per cent of capacity, and the lowest monthly tonnage since December, 1934. The November total was 37 per cent below that of October and 59 per cent below March, the peak month of 1937.

Pig iron production also dropped sharply last month, the loss in the daily rate amounting to 28.3 per cent. Total output was 2,006,724 tons compared with 2,892,629 tons in October. The daily rate in November of 66,891 tons was the lowest since March, 1936. There was a net loss of 38 furnaces; on Dec. 1 the number in operation was 113 against 151 on Nov. 1.

THERE have been some price developments, the most important of which is the announcement of a continuation of the present prices of $5.35, Pittsburgh, and $5.45, Gary, on tin plate through the first nine months of 1938. Prices of black plate were reaffirmed for the first quarter. Concrete reinforcing bar distributers have announced a reduction of $2 a ton on billet steel and rail steel bars out of stock, effective Dec. 11, and all outstanding jobs must be closed by Dec. 20. While the change is nominally a reduction, prices quoted recently by distributers have ranged from $8 to $15 a ton below published resale prices. On a Government project a bid of 1.83c. a lb., Chicago, was made recently, or $15.40 a ton below the published price. Mill quotations to distributers are unchanged. On flat galvanized sheets and on formed roofing and siding the carload discount of 15c. per 100 lb. now applies on 40,000 lb. instead of 80,000 lb. as heretofore, and a jobbers discount of 10c. per 100 lb. on flat galvanized sheets has been restored. A leading maker of ferroalloys has reaffirmed present quotations for the first quarter with some minor revisions on less-carload and package lots of ferrosilicon, ferrochrome and silico manganese.

Outstanding among structural steel awards totaling 16,750 tons are 5150 tons for a tool and die shop for Ford Motor Co. and 3000 tons for power plants at Bay City and Essexville, Mich., for the Consumers Power Co. Among new projects of 11,000 tons is 2560 tons for a lift bridge and grade elimination in connection with the Bronx-Whitestone bridge, New York.

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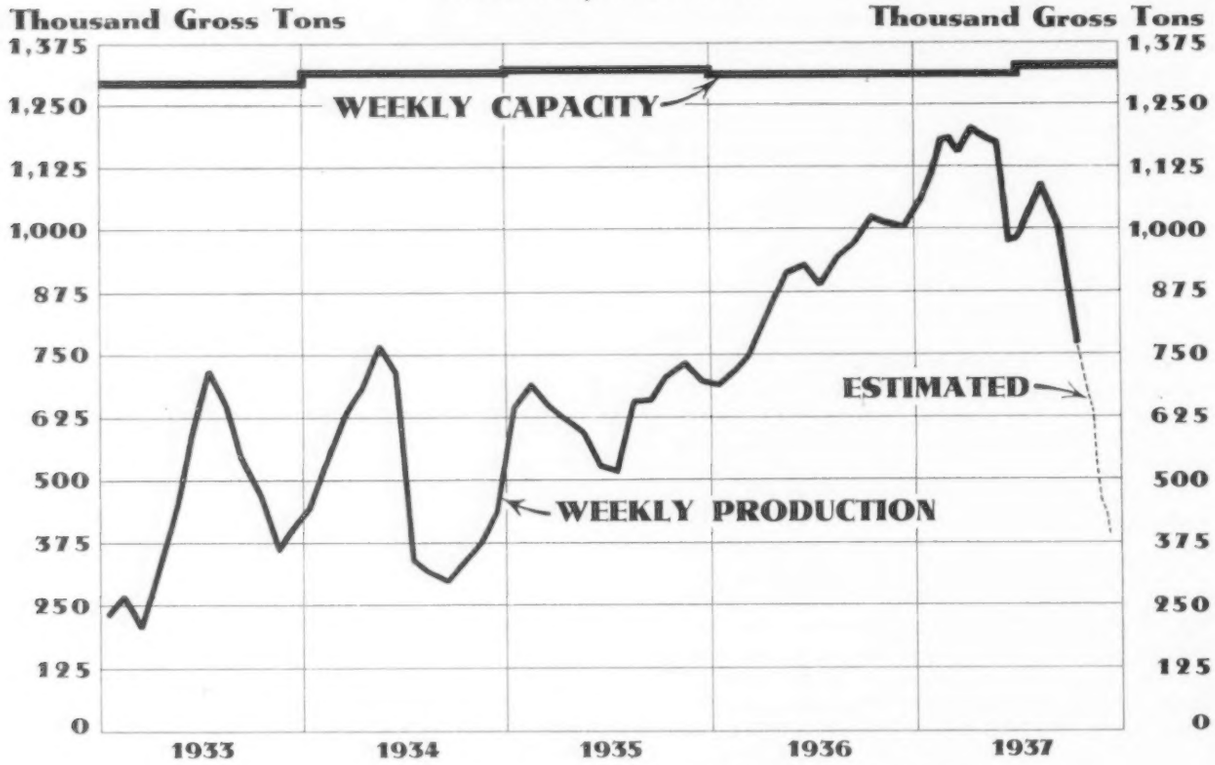

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. . . PITTSBURGH . . .

. . . Ingot production off again, sharply in Wheeling-Weirton area.

o o o

. . . Tin plate price of $5.35 announced for nine months of 1938.

o o o

. . . Beehive furnace coke off 25c.; scrap stiffens but prices are unchanged.

PITTSBURGH, Dec. 7.—Steel ingot output in the Pittsburgh district this week is estimated at 24 per cent of capacity, down one point from last week. Operations at individual plants are highly irregular. Some producers have shown a slight improvement while others have further curtailed output. Wheeling-Weirton district ingot output is off 12 points to 44 per cent of capacity.

For the third consecutive week the total volume of incoming business has shown little change. It might be concluded from this that the decline in new finished steel business has been checked. However, it is anticipated that sales during the next few weeks will be affected by usual year-end holiday influences, and as a result, may not come up to the volume booked during the past few weeks. It is also true that some of the present specifications are for shipment after the first of the year. Hence, the district operating rate is not getting the full benefit of incoming business.

Changes have been announced on selling practices of formed roofing and flat galvanized sheets. Heretofore it was necessary to purchase 80,000 lb. of light gage formed roofing and siding for shipment at one time to one destination in order to qualify for the 15c. per 100 lb. quantity discount. This discount is now available on individual sales of 40,000 lb. or more for shipment at one time to one destination. On flat galvanized sheets a functional discount of 10c. per 100 lb. is now given to jobbers and dealers on material for resale purposes. This functional discount was not granted heretofore.

Prices on tinplate and special coated manufacturing ternes have been reaffirmed for the first nine months of 1938 and black plate quotations will be unchanged for first quarter shipment.

Of interest is the strengthening in concrete bar prices. Fabricators are now quoting 2.45c. a lb. f.o.b. Pittsburgh. Mill prices to jobbers are 2.15c. a lb. on stock lengths and 2.30c. a lb. on cut lengths f.o.b. Pittsburgh.

Sentiment among scrap brokers has improved recently but quotations on No. 1 heavy melting steel remain unchanged at $13 to $13.50.

Beehive furnace coke is off 25c. to a range of $4 to $4.25 a ton Connellsville, prompt.

Pig Iron

New business is slow in materializing. Orders are small and not numerous. Steel producers have further curtailed the number of active steel making stacks and production on those remaining in blast has been cut down.

Semi-Finished Steel

Orders in the past week showed some improvement from the previous period. On the whole, specifications, however, are for odd-lot tonnages. Most consumers have supplies enough on hand to carry them into next year. Some improvement in export business occurred during the past week.

Bars

The volume of hot rolled bar orders is changed but little from a week ago. New business is composed entirely of small fill-in tonnages. In some cases, weekly bookings are insufficient to schedule rolling mills for more than a day or two. Many producers are curtailing operations completely one week in order to accumulate orders for a more economical rolling during the subsequent period.

Cold Finished Bars

New business is disappointing. Orders during the past week are not up to the volume of the previous period. Automotive tonnages are highly irregular and miscellaneous purchases continue slow.

Reinforcing Bars

Awards are fairly numerous. A project involving 1500 tons for the Bronx approach of the Triborough Bridge, New York, has been let to Carroll-McCreary, Inc., New York. Other awards involve tonnages of approximately 100 tons. Inquiries are not impressive. Published prices on billet steel bars have been reduced $2 a ton by distributers to 2.45c., Pittsburgh. A $2 reduction has also been made on rail steel.

Plates & Shapes

Structural plate and shape specifications during the past week were about on a par with those of the previous period. New inquiries, however, have shown considerable improvement. Awards are also slightly better than the volume of a few weeks ago. Bethlehem Steel Co., Bethlehem, Pa., will furnish 4000 tons of fabricated material for a Pennsylvania State office building.

Tubular Products

Total orders for tubular goods show practically no change from recent activity. Incoming business is mostly for small tonnages. Current specifications are being affected some by the present business outlook but are also being influenced by the usual year-end inventory practices.

Wire

Wire business is off slightly from a few weeks ago. Buying has slowed up some with most jobbers out of the market until after the turn of the year. Automotive purchases have declined and miscellaneous orders for manufacturers' wire are slow.

Tin Plate

The leading interest has reaffirmed present prices on tin plate and special coated manufacturing ternes covering the contracting period from Jan. 1 to Sept. 30, 1938, inclusive. Transportation charges at the time of shipment will determine the delivered prices during this period. Present black

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Dec. 7, 1937	Nov. 30, 1937	Nov. 9, 1937	Dec. 8, 1936
Rails, heavy, at mill	$42.50	$42.50	$42.50	$39.00
Light rails, Pittsburgh	43.00	43.00	43.00	35.00
Rerolling billets, Pittsburgh	37.00	37.00	37.00	32.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	32.00
Slabs, Pittsburgh	37.00	37.00	37.00	32.00
Forging billets, P'gh	43.00	43.00	43.00	39.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	43.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	2.05
Bars, Chicago	2.50	2.50	2.50	2.10
Bars, Cleveland	2.50	2.50	2.50	2.10
Bars, New York	2.79	2.79	2.78	2.40
Plates, Pittsburgh	2.25	2.25	2.25	1.90
Plates, Chicago	2.30	2.30	2.30	1.95
Plates, New York	2.54	2.54	2.53	2.19
Structural shapes, Pittsburgh	2.25	2.25	2.25	1.90
Structural shapes, Chicago	2.30	2.30	2.30	1.95
Structural shapes, New York	2.5125	2.5125	2.5025	2.16¼
Cold-finished bars, P'gh	2.90	2.90	2.90	2.35
Hot-rolled strips, P'gh	2.40	2.40	2.40	2.15
Cold-rolled strips, P'gh	3.20	3.20	3.20	2.85
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	2.80
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	2.90
Sheets, galv., No. 24, P'gh	3.80	3.80	3.80	3.40
Sheets, galv., No. 24, Gary	3.90	3.90	3.90	3.50
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	2.15
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	2.25
Cold-rolled sheets, No. 20, Pittsburgh	3.55	3.55	3.55	3.25
Cold-rolled sheets, No. 20, Gary	3.65	3.65	3.65	3.35
Wire nails, Pittsburgh	2.75	2.75	2.75	2.25
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.30
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Plain wire, Chicago dist. mill	2.95	2.95	2.95	2.65
Barbed wire, galv., P'gh	3.40	3.40	3.40	2.70
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	2.75
Tin plate, 100 lb. box, P'gh.	$5.35	$5.35	$5.35	$5.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	Dec. 7, 1937	Nov. 30, 1937	Nov. 9, 1937	Dec. 8, 1936
No. 2 fdy., Philadelphia	$25.76	$25.76	$25.76	$22.3132
No. 2, Valley furnace	24.00	24.00	24.00	20.50
No. 2, Southern Cin'ti	23.89	23.89	23.69	20.44
No. 2, Birmingham†	20.38	20.38	20.38	16.88
No. 2, foundry, Chicago*	24.00	24.00	24.00	20.50
Basic, del'd eastern Pa.	25.26	25.26	25.26	21.8132
Basic, Valley furnace	23.50	23.50	23.50	20.00
Malleable, Chicago*	24.00	24.00	24.00	20.50
Malleable, Valley	24.00	24.00	24.00	20.50
L. S. charcoal, Chicago	30.24	30.24	30.04	26.2528
Ferromanganese, seab'd carlots	102.50	102.50	102.50	80.00

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 0.70 per cent or higher.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$13.25	$13.25	$13.75	$17.75
Heavy melting steel, Phila.	14.25	13.75	13.75	15.25
Heavy melting steel, Ch'go	11.75	11.75	13.00	16.50
Carwheels, Chicago	14.50	14.50	15.25	17.00
Carwheels, Philadelphia	16.25	16.25	17.75	16.75
No. 1 cast, Pittsburgh	16.25	16.25	16.75	16.75
No. 1 cast, Philadelphia	16.25	16.25	17.75	16.75
No. 1 cast, Ch'go (net ton)	11.50	11.50	11.50	14.50
No. 1 RR. wrot., Phila.	16.25	16.25	17.75	15.75
No. 1 RR. wrot., Ch'go (net)	9.75	9.75	11.25	14.25

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$4.00	$4.25	$4.25	$3.85
Foundry coke, prompt	5.00	5.00	5.00	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	10.50	10.75	11.00	10.50
Lake copper, New York	11.125	11.125	12.125	10.62½
Tin (Straits), New York	44.50	42.50	43.00	51.62½
Zinc, East St. Louis	5.00	5.25	5.75	5.05
Zinc, New York	5.35	5.60	6.10	5.42½
Lead, St. Louis	4.85	4.85	4.85	5.05
Lead, New York	5.00	5.00	5.00	5.20
Antimony (Asiatic), N. Y.	14.50	14.75	16.50	12.62½

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
Dec. 7, 1937	2.605c. a Lb.	$23.25 a Gross Ton	$13.08 a Gross Ton
One week ago	2.605c.	23.25	12.92
One month ago	2.605c.	23.25	13.50
One year ago	2.274c.	19.73	16.50
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1937	2.605c., Mar. 9	2.330c., Mar. 2	$23.25, Mar. 9	$20.25, Feb. 16	$21.92, Mar. 30	$12.92, Nov. 16
1936	2.330c., Dec. 28	2.084c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.130c., Oct. 1	2.124c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, April 23
1934	2.199c., Apr. 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., Apr. 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., Apr. 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

plate quotations have been reaffirmed for first quarter delivery. Tin plate specifications aside from those for advance rolling continue to decline. Operations this week may be estimated at 57 per cent.

Sheets

Certain changes have been announced on formed roofing and flat galvanized sheets. The 10c. a 100 lb. functional discount to jobbers and dealers on gages 26, 28 and 29 formed roofing and siding galvanized sheets for carload or less carload lots has been extended to include all gages. The 15c. a 100 lb. quantity discount on 80,000 lb. of 26, 28 or 29 gage formed roofing and siding galvanized sheets has been made applicable to 40,000 lb. or more for single orders for shipment at one time to one destination. On all flat galvanized sheets a functional discount of 10c. a 100 lb. is given to jobbers and dealers on material for resale purposes. Heretofore, such functional discount was not granted. Meanwhile, aggregate sheet business is slightly better than a week ago but total tonnages are still unimpressive. Some automotive customers have pushed back shipment dates at least two weeks. New automotive business is rather scarce.

Strip

Specifications are no better than a week ago and incoming business reflects the lethargy which has pervaded this market during the past few months. Most consumers are bending every effort towards depletion of inventories with the result that strip producers expect no material change in activity, at least before the turn of the year.

Coal and Coke

Local coal producers are busy studying prices promulgated by the Coal Commission to be effective Dec. 16. The making of the prices has had little effect on business as most industrial consumers are well stocked with supplies and would have no incentive to add further to this inventory. Beehive furnace coke prices are down 25c. to a range of $4 to $4.25 a ton. Some spot business has been done at $4 a ton and some contracts for the first quarter have been made at $4.25.

Hartford, Conn., has awarded 27,000 ft. of 6-in. pipe, 18,300 ft. of 8-in., 12,000 ft. of 10-in. and 300 ft. of 12-in. to Florence Pipe & Machinery Co., Burlington, N. J.

Hampden, Me., has awarded about 1200 tons of 6 to 12-in. to Warren Foundry & Pipe Corp., Everett, Mass.

North Haverhill, N. H., has taken under advisement bids on 15,000 ft. of 6 to 12-in. pipe.

Lincoln, Mass., has awarded 6800 ft. of 12-in. to Warren Foundry & Pipe Corp.

Rossville, Ind., will take bids soon for pipe for water system; also for elevated steel tank and tower, pumping machinery and auxiliary equipment. Cost about $36,300. Financing has been arranged through Federal aid. Charles H. Hurd, Architects' and Builders' Building, Indianapolis, is consulting engineer.

Tulsa, Okla., plans pipe lines for extensions and replacements in water system. Special election has been called Dec. 14 to approve bonds for $600,000 for this and other waterworks installation.

Lexington, Mich., plans pipe lines for water system and other waterworks installation. Francis Engineering Co., Saginaw, Mich., is consulting engineer.

Saginaw, Mich., plans 4, 6 and 8-in. pipe in Inglehart, Gilbert and other streets for extensions in water system. Cost about $16,000. L. P. Cookingham is city manager.

Brandon, Wis., has rejected bids recently received for pipe for water system and other waterworks equipment, including elevated steel tank and tower. New bids will be asked soon. Jerry Donohue Engineering Co., 608 North Eighth Street, Sheboygan, Wis., is consulting engineer.

Town of Lake, Milwaukee County, Wis., has low bids of $669,549 from Wenzel & Henoch Co., Milwaukee, for 225,000 lin. ft. of 6 to 16-in. water main.

Allerton, Iowa, closes bids Dec. 10 for pipe for water system and other waterworks equipment. Cost about $45,000.

Ruston, La., will ask bids early in 1938 for pipe for water system and other waterworks installation, including pumping machinery; also for extensions in sewage system. Cost about $135,000. L. J. Voorhies, City Hall, Baton Rouge, La., is engineer.

South Ogden, Utah, plans about 10 miles of 4-in. and main 6-in. line from water reservoir to city, work to begin in January. Fund of $127,000 has been arranged through Federal aid.

Ontario, Ore., asks bids until Dec. 16 for pipe for water system, including trunk line from reservoir to municipal limits; also for pumping machinery and other waterworks equipment. L. R. Stockman, Baker, Ore., is consulting engineer.

Preston, Idaho, will take bids soon for pipe for water system and other waterworks installation. Fund of $102,000 has been arranged through Federal aid. Robert G. Harding, Bountiful, Utah, is consulting engineer.

La Mesa, Lemon Grove & Spring Valley Irrigation District, 4769 Spring Street, La Mesa, Cal., closes bids Dec. 14 for unit No. 1 of water distribution system, including 3121 ft. of 12-in., 1820 ft. of 8-in., 43,075 ft. of 6-in., 10,605 ft. of 4-in.; also 52,139 lb. of fittings, valves, etc. C. Harritt is general manager and chief engineer.

East Bay Municipal Utility District, Oakland, Cal., has awarded 380 tons of 6-in. pipe to United States Pipe & Foundry Co., San Francisco, and 330 tons of 8-in. to American Cast Iron Pipe Co., San Francisco.

King County, Wash., has again taken bids on 600 tons of 4, 6 and 12-in. cast iron (alternate steel) pipe and fittings.

Pueblo, Colo., asks bids until Dec. 15 on 294 tons of 8, 10 12 and 16-in. pipe for new sewage disposal system.

. . . *St. Louis-San Francisco to buy rails, repair cars.*

ST. LOUIS, Dec. 7. — The St. Louis-San Francisco Railway, the first of the railroads here to put its 1938 budget before the Federal Court for approval, has asked for authority to expend $3,464,336 next year. The largest item is $1,172,827 for 75 miles of 112-lb. rails and tie plates and other track accessories. The budget also includes $748,057 for freight car repairs and the building of 20 cabooses in the company's shops. Engine repairs total $72,715, and other items include signals and interlocking equipment, $134,537; roadway tools and machinery, $40,864 and shop machinery, $23,669.

The Laclede Steel Co. has been awarded 200 tons of reinforcing bars for a building for the Masonic Home here. Fegles Construction Co., Minneapolis, is the low bidder on the general contract for construction work at Fort Peck, Mont., requiring 1600 tons of reinforcing bars. The State office building at Jefferson City, Mo., a seven-story building of limestone and reinforced concrete, will be ready for bids about Feb. 1; the cost is to be about $850,000.

Buying of finished steel is still rather quiet, although one mill sold a sizable tonnage of hot rolled sheets for delivery between Jan. 1 and Feb. 1. Warehouse business for November was estimated to be about on a par with the same month last year, but between 10 and 15 per cent less than for October this year.

There was little buying of pig iron during the week. Stove plants in the St. Louis area are down for the rest of the year, and business with the jobbing foundries is light. Some makers are receiving hold orders for pig iron bought on contracts.

Ingot operations for the district advanced four points during the week to 23 per cent of capacity.

. . . . CHICAGO . . . .

. . . Ingot rate drops six points to 24%, but orders gain.

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. . . Northern Pacific orders 30,000 tons of rails; Santa Fe buys equipment.

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. . . Steel scrap unchanged for third consecutive week.

CHICAGO, Dec. 7.—Though two sales offices here reported improvement in the volume of new business and others saw little or no change, steel output fell sharply this week to 24 per cent of capacity, a loss of six points from last week. Three blast furnaces were taken from blast and one added, making a total of 14 in operation of the 37 furnaces available.

This week again a paradoxical situation presents itself. Together with the report of operations that accounted for most of this week's six-point drop, was stated the surprising fact that this particular mill's sales and orders were so improved as to equal the highest figure in the past eight weeks, and eight weeks ago the company's operations were much higher than the rate reported today.

Another mill reported a 21 per cent drop in output from last week, but stated that within the next 10 days or two weeks most of this loss should be restored. The decrease this week was largely caused by periods of inventory reduction among the mill's customers.

Some railroad business has been received for completion of work on cars ordered long ago. The Northern Pacific just placed 30,000 tons of rails and the Santa Fe bought 43 stainless steel passenger cars and seven diesel locomotives at a cost of $4,800,000.

Although several hundred men were laid off by the Caterpillar Tractor Co. over the week-end, the tractor and farm implement manufacturers generally are still well occupied. Only 20 per cent, roughly, of Caterpillar's business goes to the farm, the larger portion being industrial.

Present prices of $5.45 a base box, Gary, for tin plate and $4.75 a base box for special coated manufacturing ternes, have been reaffirmed for shipment to Sept. 30, 1938. Present prices on tin mill black plate have been extended to March 31, 1938. Three weeks is being quoted by one mill here for delivery of tin plate.

The Illinois Manufacturers Association has condemned high hourly wage rates for building mechanics as one of the principal causes of the lack of building and building employment here. The low per capita building record of Chicago has been compared with that of other cities where the wage rates were lower.

For the third successive week, the price of heavy melting steel scrap is unchanged at $11.50 to $12 a gross ton. No mill interest has yet been shown.

The Illinois Zinc Co. is planning to build a $500,000 zinc strip rolling mill in this district when conditions justify the expense.

A dispatch from the Kansas City *Star* today reports that labor has agreed not to again halt the proposed addition of one open-hearth furnace and the enlargement of several departments at the Kansas City plant of the Sheffield Steel Corp.

Pig Iron

Foundry melt has slumped sharply in the past week, shipments of foundry coke for the first five days of the month being 25 per cent under those in the same period of October. Pig iron shipments are also off considerably, with little support being given by the foundries supplying automobile and railroad equipment manufacturers. Only 14 blast furnaces are operating currently. November production totaled 353,420 tons against 527,334 tons in October.

Rails

The Northern Pacific this week purchased 30,000 tons of rail, awarding 20,000 tons to Carnegie-Illinois, 9000 tons to Bethlehem and 1000 tons to Colorado Fuel & Iron Co. It is said here that the 20,000-ton rail program of the Great Northern has been postponed.

Sheets

Automobile or other consumer demand for sheets is not an important factor in the increase reported by some sellers here this week in total sales. Instead, specifications from the motor car makers are holding at the level of the past several weeks, and no change is noticeable in the status of the other sheet users. Cold rolled sheets may be obtained in two to three weeks, as can hot rolled annealed, while enameling stock, galvanized, and tin plate are requiring three weeks.

Plates

Delivery of plates is now being quoted at one week to 10 days, as against a week previously. It is understood that steel for the completion of freight cars ordered some time ago is being specified. No buying of new railroad equipment has been reported, but much optimism is being expressed based on the hope of considerable buying if the freight rate advances are allowed.

Structural Shapes

After a few weeks in which private construction exceeded public projects, highway bridges return to the fore this week and compose the bulk of the structural lists. No large items are included, in either the awards or inquiries, most of the latter consisting of 200-ton jobs or less.

Reinforced Steel

Awards and inquiries this week are extremely few, and none of any size was reported. Several important projects, such as the La Crosse, Wis., bridge, and the Pulaski School in Milwaukee, are pending, but other than these, large construction jobs are scarce.

Chesapeake & Ohio is inquiring for 14 locomotive tenders.

Santa Fe has ordered 43 stainless steel passenger cars from Edward G. Budd Mfg. Co. and seven diesel locomotives, two 3600 hp., and five 1800 hp. from Electro Motive Corp.

Western Pacific has ordered 400 freight cars.

St. Louis-San Francisco has asked for authority to expend $72,715 for engine repairs and $748,037 for freight car repairs during 1938. It proposes to equip 35 engines with foam meters to cost $10,426; 13 engines with syphons, $19,624; 65 engines with power reverse gears, $19,322; 25 engines with Gunderson device, $12,031, and 5000 freight cars with bolster friction truck springs, $150,750; build 20 cabooses, steel underframe and superstructure, $49,920; increase roof heights and apply side and end plate extensions and all steel roofs, Union Dudley door fixtures and modify Evans auto loaders from class A to class D on 141 automobile cars, $105,540; also to equip 1000 freight cars with AB brakes, $209,420; 500 hopper cars with one-wear rolled steel wheels, $162,130, and 3000 freight cars with 4-point brake beam supports, $64,650.

St. Louis-San Francisco has asked for authority to purchase during 1938 roadway tools and machinery as follows: Transverse fissure detector car, $40,864; compressor and air tools for timber bridge gangs, $4,434; three Rawl track movers, $3,060; track motor cars, $5,000; two Nordberg mechanical spike pullers, $339, and Ingersoll-Rand air compressors for steel bridge gangs, $280.

American Car & Foundry Motors Co. has received the following orders for motor coaches: 15 for Gary Railways Co., Gary, Ind.; five for Los Angeles Railway Corp., Los Angeles; three for San Diego Electric Railway Co., San Diego, Cal., and one for Collacutt Coach Lines, Oshawa, Ont. Cumberland & Westernport Transit Co., Frostburg, Md., has placed a repeat order for one coach.

Missouri Pacific has been granted authority to advance $250,000 to Missouri Pacific Transportation Co., a subsidiary, to finance purchase of 20 new buses.

General Railway Signal Co., St. Louis, is low bidder on interlocking and signaling equipment for St. Louis municipal bridge, bidding $490,000 for equipment and $210,800 for installation.

RAILS AND TRACK SUPPLIES

Central of Georgia has placed 2836 tons of rails with Tennessee Coal, Iron & Railroad Co.

St. Louis-San Francisco has asked for authority to expend $1,172,827 to purchase 75 miles of 112-lb. rails, of which 68.6 miles will be used in substitution for present rails of lesser weight. This sum also includes $139,950 for tie plates for the new rails, and $225,000 for tie plates, rail anchors and gage rods to protect ties already inserted.

Southern Pacific is reported to have placed an additional rail order for 40,000 tons, but distribution has not been announced. This road placed about 35,000 tons a few weeks ago.

Western Pacific has placed 22,000 tons of rails, but details are temporarily withheld, as the business is said to be contingent upon granting of a freight rate increase by the Interstate Commerce Commission.

Northern Pacific has ordered 20,000 tons of rails from Carnegie-Illinois Steel Corp., 9000 tons from Bethlehem Steel Co. and 1000 tons from Colorado Fuel & Iron Co.

Kansas City Southern has ordered 5000 tons of rails, of which 4000 tons was placed with Carnegie-Illinois Steel Corp.

. . . *Heavy pig iron sales; cartel statement expected Thursday on negotiations with U. S.*

LONDON, Dec. 7 (*By Cable*).—There have been heavy sales of Cleveland foundry and hematite pig iron for first half of 1938 and none is available for this year. Only one Cleveland furnace is producing foundry iron, but others are likely to be started as consumers are clamoring for increased production now that a loyalty rebate of 5s. has been introduced.

Semi-finished supplies are increasing and consumers are better placed. Heavy steel makers are heavily sold for domestic account for fully six months. Shipbuilders are complaining about delivery delays on ship steel. Steel departments dependent mainly on export business are now running short of orders and are offering quick shipment, but buyers are slow to respond.

Business in the Continental steel market is quiet, but inquiries are broadening and the outlook is considered more hopeful. Negotiations with United States are reported to be proceeding satisfactorily. A full statement is expected at the cartel meeting at Dusseldorf on Thursday.

The tin plate market is inactive except for the placing of the usual Canadian order for 1,250,000 base boxes. Unfilled orders, excluding the Canadian order, amount to about 4,000,000 base boxes. Mill operations are at 71 per cent. The price of Welsh tin plate bars is unchanged at £7, 15s., delivered January to June. The market for black sheets is dull and home prices have been reaffirmed for the whole next year. Galvanized sheet market is dull and home prices have reduced one pound to £18, 10s., delivered basis, on 24 gage, for first half delivery.

. . . *Rail and car buying on a contingent basis.*

SAN FRANCISCO, Dec. 6.—Activity was at a standstill this week in all fields except railroad buying and cast iron pipe. Some railroad purchases are being made with the expectation that a substantial rate increase will be granted, but are held in secrecy for fear that publicity would adversely affect chances for obtaining the rate rise. Orders placed or contingent upon the rate increase include 40,000 tons rails for the Southern Pacific Co. and 22,000 tons rails and 400 freight cars for the Western Pacific Railroad.

The East Bay Municipal Utility District, Oakland, Cal., has awarded 380 tons 6-in. cast iron pipe to the United States Foundry Co., San Francisco, and 330 tons 8-in. pipe to the American Cast Iron Pipe Co., San Francisco. Kings County, Wash., has again taken bids on 600 tons of 4 to 12 in. cast iron pipe on which previous bids were rejected as too high.

. . . *Structural steel jobs in fair number.*

BUFFALO, Dec. 7.—While the steel fabrication industry has felt the impact of the recession which started for it in the early fall, many plants are finding a volume of small jobs which are aiding in keeping shops partly occupied. In addition, a few jobs of considerable tonnage have been interspersed.

A Buffalo structural steel fabricator has the contract for 500 tons for the addition being built for the William Hengerer Co. department store in Buffalo. The last lettings of the steel for the Buffalo sewage disposal plant have been made, 150 tons going to a Buffalo fabricator and 250 tons of steel bearing piles to an out-of-district maker. A Buffalo contractor is low bidder on a job involving 150 tons of structural steel for a centralized school at Elba, N. Y., and a school of Vestal, N. Y., will require 500 to 600 tons of structural steel.

. . . CLEVELAND . . .

. . . Ingot rate unchanged in Cleveland-Lorain, up at Youngstown.

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. . . Steel buying shows little change; stocks being reduced somewhat.

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. . . Three railroads may come into market for rails in January.

CLEVELAND, Dec. 7.—With production leveled off to a volume corresponding to the amount of incoming business, ingot output appears to be well stabilized for the time being at what is believed to be the low point in the present period of business recession. Steel output is unchanged at 31 per cent of capacity in the Cleveland-Lorain district this week. In the Youngstown district there is a one point gain to 29 per cent of capacity.

The volume of business in finished steel so far this month shows very little change from the latter part of November. While a few of the mills report a slight gain in the number of orders, the increase is not sufficient to indicate a definite upward trend. Consumers continue to follow a hand-to-mouth buying policy, all orders being for small lots.

While reports are somewhat conflicting regarding the amount of steel consumers are now carrying in stock, it is evident that many plants have reduced their stocks to the extent that they are no longer abnormal in size and some have cut them down to the extent that they are much less than normal.

Some estimates indicate that present steel production is only 50 per cent of the amount that is being consumed. Steel sales offices expect that with the greatly reduced stocks the demand for steel will take a rather sharp rebound when the real turn for the better becomes evident.

The Chesapeake & Ohio, Erie and Nickel Plate railroads are expected to come into the market for rails soon after the first of the year. Some of the rail purchases probably will be scaled down as compared with the tonnage bought for 1937, but additional orders may be placed later should the Interstate Commerce Commission authorize an increase in freight rates.

Leading producers have reaffirmed the present price on tin plate for the period from Jan. 1 to Sept. 30 and the present price on tin mill black plate for the first quarter.

Pig Iron

From present indications December shipments of pig iron will be off from the November volume, which in turn fell below October by approximately 20 per cent. With the exception of the agricultural implement industry, very few consumers are ordering to the extent comparable with the activity of the second and third quarters. Stocks of both consumers and producers are not as extensive as might be expected at this time. Producers indicate that some tonnage will be carried over into the first quarter of 1938.

Sheets and Strip

Incoming business in sheets continues moderate with large tonnages lacking and only a limited number of smaller orders. The automotive industry is active, but specifications from this source have been below expectations. Stove and refrigerator manufacturers are slowly getting into production on new models and may require more material in the near future. In all of the consuming fields inventories appear lower than they were at this time one month ago. In hot and cold rolled strip steel, reduction of inventories is proceeding methodically and automotive parts makers are less active than they were a few weeks ago. Producers of sheets and strip anticipate a better volume of new business, possibly by the middle of January.

Wire Products

Small fill-in orders are coming from jobbers and consumers whose stocks have become greatly reduced. While the trade looks for considerable improvement in January the volume of business during the remainder of this month is expected to continue light. Mills report considerable pressure for lower prices and some buyers evidently are holding off in the hope of securing concessions. While mills are adhering to regular quotations, some jobbers are cutting prices on stocks that were purchased before the last price advance.

Bars, Plates and Shapes

Demand for hot rolled bars shows little change. Orders are confined to small lots mainly for filling in. Little new tonnage is coming from motor car plants. Forge shops doing miscellaneous work appear to be busier than those that depend mostly on orders for automobile forgings. The Ford Motor Co. has placed 5150 tons of fabricated material for a tool and die shop, and the award of 3000 tons for powerplants for a Michigan utilities company is reported. The Ohio State Highway Department awarded a bridge taking 150 tons. A reduction in the resale price of reinforcing bars is proposed, thus cutting down the differential of $8 a ton or more between the distributers' buying and selling price. Very little plate tonnage is coming out.

. . . . PIPE LINES . . . .

United States Engineer Office, New Post Office Building, Pittsburgh, asks bids until Dec. 18 for earth fill dam and appurtenant structures for Tionesta dam, Tionesta Creek, near Tionesta, Pa., including 27,000 lb. of black steel pipe, 200,000 lb. of cast iron pipe, and 14,000 lb. of wrought iron pipe (Circular 170).

Barker & Woods, Houston, Tex., oil operators, plan new 6-in. welded steel pipe line from Lisbon oil field, Clairbourne and Lincoln Parishes, La., to Monroe, La., about 47 miles, for crude oil transmission to bulk oil terminal to be built on waterfront at latter place for loading tankers for shipment to Houston. Cost over $300,000 with booster pumping stations along route.

Adair, Okla., plans steel pipe lines for municipal natural gas distribution, includ-

ing control station and main welded steel pipe line for connection with supply lines. Estimates of cost are being made. L. C. White, mayor, is in charge.

Southern Natural Gas Co., Birmingham, has arranged for an issue of first mortgage pipe line sinking fund bonds totaling $650,000, proceeds to be used for extensions and improvements in steel pipe lines, plant and equipment.

People's Water & Gas Co., 637 Washington Avenue, Miami Beach, Fla., plans steel pipe line for high-pressure gas service across Biscayne Bay, connecting Miami and Miami Beach lines.

Standard Oil Co., Shreveport, La., plans 4-in. welded steel pipe line across Bayou Plaquemine Brule, Acadia Parish, La., to be installed five feet below ground level.

United Carbon Co., Charleston, W. Va., plans welded steel pipe lines from natural gas district in Grapevine Creek area, near Sissonville, W. Va., where development of new wells will be carried out, for connection with present natural gas transmission lines; also installation of 6-in. steel pipe in connection with drilling operations.

Bureau of Reclamation, Denver, asks bids until Jan. 6 for steel penstocks and steel pump-inlet pipes for Grand Coulee Dam, Wash., including three 72-in. dia. and 18 18-ft. dia. steel penstocks, and 12 14-ft. dia. steel pump inlet pipes, with all field welding for pipes after placed in position (Specifications 760).

Bureau of Reclamation, Denver, let contract to Treadwell Construction Co., Midland, Pa., for steel penstocks and steel outlet pipes for power plant and outlet works at Seminoe dam, Kendrick, Wyo., project, at $22,176 (Specifications 975-D).

General Purchasing Officer, Panama Canal, Washington, closes bids Dec. 9 on 47,500 ft. of welded galvanized steel pipe; also 2,480 ft. of welded black steel pipe.

. . . *Moderate tapering in steel and pig iron business.*

TORONTO, Dec. 7.—There has been a minor tapering off in business in the Canadian iron and steel markets, and sales now are running below those of the former high peak. However, there has been little or no curtailment in operations. Export demand for steel also has fallen off recently. It is expected, however, that there will be a sharp pickup in new business with the turn of the year. Books have not yet opened for first quarter contracts. Steel interests decline to make statements regarding price revisions for the coming quarter.

The automotive industry has not got into full swing on its 1938 car models, with the result that associated plants are operating on somewhat reduced schedules from the peak levels earlier in the year, and consumption of pig iron and other raw materials is correspondingly reduced. Agricultural implement makers as well as sanitaryware plants and radiator firms are taking iron at intervals, and there is a fair call from these consumers. Pig iron production continues at a high level, with six stacks blowing.

In the iron and steel scrap markets business is holding to a fairly steady level and consumers are in the market for supplies. Dealers state that they still find a demand for machinery cast, stove plate, wrought scrap and heavy melting steel, this being due to the fact that supplies of these lines are somewhat limited in the local area and practically nothing is being offered from the rural districts at this season. Other lines, more plentiful, are moving slowly.

. . . *Further reduction of pig iron and steel output.*

BIRMINGHAM, Dec. 7.—There has been a marked curtailment of pig iron shipments lately and this has brought a substantial reduction in the operations of merchant producers. During November there was a loss of four stacks. Sloss-Sheffield Steel & Iron Co. and the Woodward Iron Co. each blew out a furnace, while Republic Steel Corp. banked two, one at Thomas and one at Gadsden. Fourteen stacks are now operating, and eight of these belong to the Tennessee Coal, Iron & Railroad Co. Woodward Iron Co. is operating two; Sloss-Sheffield, three; Republic Steel, one.

Pig iron prices are firm but there is very little current interest in first quarter. Most foundries are already covered for this quarter and the only new business is small spot orders. With no price change, melters are marking time for the next quarter.

Steel buying is only moderate. Buyers continue to order only as needed. Prices remain firm in the face of this light demand. Production of the Tennessee Coal, Iron & Railroad Co. is being largely sustained by rail tonnage. Republic Steel, lacking this, has sharply reduced its output. Only two open hearths out of six are now being worked. For many months all six were active. The Tennessee company is working six at Fairfield and three at Ensley. This is a total of 11 for the district.

. . . *Mystic furnace blown out.*

BOSTON, Dec. 7.—The Mystic Iron Works blew out its furnace on Nov. 30, thereby emphasizing the quietness of the pig iron market. Not only is there a lack of foundry buying, but export as well. New England industries are gradually reducing working forces, which means a dwindling call for castings. Production of electrical equipment and refrigerators and water coolers is holding up well, but other goods are in a slump. The Pratt & Whitney division of the United Aircraft Corp. has been given a contract for 43 engines and spare parts to be installed in Northrup attack ships now under construction. The contract price was $447,328.

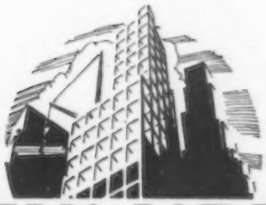
Leviathan Sold For Scrap To British

THE United States liner *Leviathan* has been sold for scrap to Thomas W. Ward, Ltd., of Sheffield, Eng., subject to approval of the United States Maritime Commission, and is to leave Hoboken within three weeks for demolition in Scotland.

A vessel of 48,943 gross tons, American troopship during the World War, the *Leviathan* was sold for about $800,000. Scrap experts say her hull contains unusually high grade heavy steel plates. Cost of taking the vessel to the shipbreakers is estimated at $45,000.

Kropp Forge Celebrates Anniversary, Opens Shop

KROPP FORGE CO., Chicago, celebrated its one-hundredth anniversary, Dec. 4, when Roy A. Kropp, president and grandson of the founder, dedicated a new quarter million dollar machine shop designed especially for the finishing of diesel engine parts and the forging of heavy railroad equipment. A feature was an exhibition of a double utilization of waste steam, the excess steam from the forging furnaces being used for energy in the generating plant from which the waste steam is directed into unit heaters.



. . . . NEW YORK. . . .

. . . Concrete bar distributors reduce published resale prices.

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. . . Tin plate quotation of $5.35 continued to Sept. 30, 1938.

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. . . Steel business shows no improvement.

NEW YORK, Dec. 7.—Concrete bar distributers have announced a reduction of $2 a ton on both billet steel and rail steel reinforcing bars out of warehouse, effective Dec. 11. Contractors and other buyers have received notice that orders must be placed not later than Dec. 20 on all outstanding quotations. While the price revision is a reduction in the published prices, it actually represents an increase over prices that have recently been quoted quite commonly on the more attractive jobs. The lowest price thus far quoted was 1.83c. a lb., Chicago, on a Government project. This was $15.40 a ton below the published resale price at Chicago and $7.40 a ton below the price that mills are quoting for stock lengths to distributers. The resale market has been badly demoralized for some months. The new quotations on billet steel bars out of warehouse are 2.45c. a lb., Pittsburgh, 2.50c., Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham, with corresponding reductions at other points. Rail steel bars are likewise marked down $2 to a basis of 2.30c. a lb., Pittsburgh, and 2.35c. at other principal basing points. There has been no change in mill prices.

Steel business generally has shown no improvement. Local sales offices have one week that is better than another, but there is no distinct trend toward increased buying and none is expected until January at the earliest. Consumers and jobbers are still carrying large stocks despite efforts to reduce them before inventory time.

The announcement of a continuation of the present price of $5.35 a base box on tin plate through the first nine months of 1938 was no the large stocks they are carrying, surprise to the trade. In view of can companies probably were not particularly anxious for a lower price, while an advance would have been out of the question under present conditions. Tin plate manufacturers have protected themselves against a rise in freight rates by specifying that rates in effect at time of shipment will apply.

Pig Iron

New continues very light as melters concentrate on reducing stocks for inventory. With the exception of machine tool parts foundries, melting operations continue to decline, many plants working on the basis of molding two days and casting one. The heavy influx of foreign machine tool orders has kept machine tool parts suppliers fairly active, but in other lines backlogs have been worked off and operations are entirely dependent upon day-to-day ordering. Ferroalloy buying has followed the ingot rate downward and consequently is very light at present, the only item of interest being the entry of the Ford Motor Co. into the market for first quarter needs. Outside of two inquiries, the largest being for 8000 tons, which have been pending for several weeks, the export market is quiet.

Plates and Sheets

Plate activity is no lower, but no material pickup is expected until after the first of the year at least. Stocks are getting lower, but what buying there is is on a hand-to-mouth basis. A few carloads were sold to a local repair shipyard last week for immediate delivery, the first action of this kind in some weeks. Foreign inquiries carry too low offers to attract much tonnage.

Sheet business has leveled off in recent weeks. The tendency to reduce inventories is still noted and ordering in for fill-in purposes on the part of both jobbers and manufacturers. Car lot tonnages or less prevail.

Wire

A large number of diversified small orders is keeping manufacturers' wire much more active than other grades of steel. One district office reports November sales above those of October and only 10 per cent below the volume sold in November, 1936. Sales calls on jobbers along the Eastern seaboard have also been rather productive in recent weeks. Shipments are being well maintained to small users, although some of the larger consumers with national distribution are reflecting curtailment in sales and operations. Prices are firm except on hardware lines, which are traditionally weak.

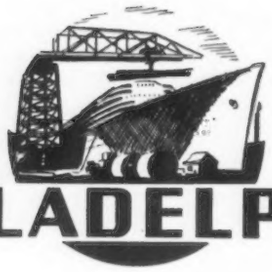
Reinforcing Bars

With the awarding of 1600 tons of bars for a grade elimination job in the Bronx to Carroll-McCreary Co., pending tonnages have been reduced considerably, the total outstanding at present being around 1700 tons. Few new projects of any size are in sight. Jobbers' prices on small jobs are holding up fairly well, but bids on large projects show the effects of severe competition.

SWOC to Deal With Bingham & Taylor

WASHINGTON, Dec. 7.—The SWOC's Amalgamated Association of Iron, Steel and Tin Workers Union has been recognized by the Labor Board as the exclusive collective bargaining representative for production workers at the Bingham & Taylor Corp. plant in Buffalo.

The NLRB checked union membership cards against company payrolls and found the CIO group had 90 members out of the plant's 109 employees. The International Molders' Union had claimed to represent some workers but a public hearing and subsequent findings indicated a majority were members of the SWOC group, the NLRB announced.



. . PHILADELPHIA . .

. . . District operating rate off to 30 per cent.

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. . . Buying almost at a standstill.

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. . . Export competition peps up scrap list.

PHILADELPHIA, Dec. 7.—Mills in the eastern Pennsylvania territory continue to drop off open hearths and operate rolling mills only one or two days a week. Even more open hearths would today be off if it were not for the necessity of keeping at least one unit running to take care of particular anaylses called for on the scattered day-to-day releases. Lukens has on four units, Pencoyd and Worth are completely off but may come in for a short time near the week's end, Central has one unit on and Alan Wood also has on one unit. This latter mill plans a complete shutdown the last two weeks of the month for repairs to the plate mill. With the line-up shown above, the average of district operations for the current week is down four points from a week ago, being now at 30 per cent of theoretical capacity.

Weakness in galvanized sheets among jobbers in New York has not been reflected here. In fact, the warehouse price structure at Philadelphia is being disturbed very little, which is unusual in view of the overstocked position of some sellers and the current very slow turnover.

Pig Iron

New foundry demands are almost nil, and the market is almost completely inactive and featureless. Sellers look for no revival until the new year, and even then not much is expected for January. The price structure so far shows no apparent weakness, but some furnace representatives are a little uncertain as to what might happen in January if any great amount of pressure should be exerted.

Sheets and Strip

About 400 tons of sheets recently placed by the Federal Prison Industries at Lewisburg on public bidding showed no price deviation from standard levels. A little new business and a scattered number of releases on outstanding contracts are all that occupy the attention of district sellers. The automobile program continues to lag, with the exception of Ford fabrication. The result is that local autobody stamping plants are in the market for little steel. Warehouses are overstocked on some grades, and in general will probably go into the new year with a considerably heavier inventory than was believed possible six weeks ago.

Plates & Shapes

New York Shipbuilding Co. has not yet received an award on the Navy ships for which it was low bidder. General demand for plate is extremely slow, and unless railroads open up there is little to be expected in the next several months. The structural fabricating market likewise is almost at a standstill, the only support being a few scattered awards from the State of Pennsylvania. There were no awards during the week, and new projects total only 375 tons for hospitals at Warren and Elizabethtown, Pa., and a highway bridge in New Jersey. With no recent reinforcing bar awards of any moment, attention of the market is centered on three jobs which McCloskey will let during the week and about 300 tons of State work up for bidding on Thursday and Friday.

Imports

The following iron and steel imports were received here during the past week: 1500 tons of manganese ore from British India; 487 tons of chrome ore from British West Africa; 66 tons of steel bands, 175 tons of steel bars and 75 tons of structural shapes from Belgium.

. . . CINCINNATI . . .

. . . New lows in incoming business and production.

CINCINNATI, Dec. 7. — Consumer reluctance to anticipate needs for sheets until the general business outlook clears, combined with the general year-end influences, is depressing the district steel market to new lows. Current business is averaging about 20 to 25 per cent of capacity output. Automobile manufacturers are holding back specifications in an apparent effort to learn the general public attitude as to new models.

Encouraging elements in the market are all of an intangible nature. Current bookings are being consumed and users are not laying down material for inventory. This places the market in a sensitive condition to any forward thrust in business activity. In addition, general feeling in the trade is that present recession is but a breathing spell and will be followed early in the new year by a steady upward trend.

A new low for the year was reached this week in ingot production when all but three open hearths in the district were idle. This brings the average under 10 per cent of capacity, with three out of a possible 34 furnaces in operation.

Jobbers' demand remains at about the early November volume. Little recession in demand under year-end influences is reported, although current orders are individually for lesser amounts. Prices remain firm.

District pig iron melters indicate a tendency to retard shipments on contract, bringing movement below early November averages. New business is all but absent as consumers order only for urgent needs and then in small quantities. No movement toward first quarter demand has been reported. The melt is slowing down. Machine tool melters are exceptional in the current market as orders continue to flow into the machinery offices.

. . .NON-FERROUS. . .

. . . *Copper prices drop to 10c., then return to 10.50c.*

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. . . *Zinc quotations lowered another $5 per ton.*

NEW YORK, Dec. 7.—Quotations on copper were lowered 0.25c. consecutively on Wednesday and Thursday to the 10c. level by custom smelters. Following the development of considerable independent demand at the 10c. level, offerings were raised to 10.50c. per lb., Connecticut Valley, where they have since remained. Producers' prices remain at the 11c. basis. Sales for the week were slightly below the previous week, totaling 3108 tons for the five-day period through Saturday. Foreign markets continue strong with brisk buying accompanying a slowing rising price. Quotations today ranged around 10.38c. per lb., c.i.f., usual European base ports, as compared with 10.125c. a week ago.

The Week's Prices. Cents Per Pound for Early Delivery

	Dec. 1	Dec. 2	Dec. 3	Dec. 4	Dec. 6	Dec. 7
Electrolytic copper, Conn.*	10.50	10.00	10.50	10.50	10.50	10.50
Lake copper, N. Y.	11.125	11.125	11.125	11.125	11.125	11.125
Straits tin, spot, New York	43.125	43.375	44.125	44.875	44.75	44.00
Zinc, East St. Louis	5.25	5.00	5.00	5.00	5.00	5.00
Zinc, New York	5.60	5.35	5.35	5.35	5.35	5.35
Lead, St. Louis	4.85	4.85	4.85	4.85	4.85	4.85
Lead, New York	5.00	5.00	5.00	5.00	5.00	5.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
Aluminum, virgin, 99 per cent plus 20.00c.-21.00c. a lb. delivered.
Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 14.50c. a lb., prompt, f.o.b., New York.
Antimony, American, 14.25c. per lb., prompt shipment, New York.
Quicksilver, $83.00 to $85.00 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 11.25c. a lb., less carload, delivered in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	45.50c. to 46.50c.
Tin, bar	47.50c. to 48.50c.
Copper, Lake	12.75c. to 13.75c.
Copper, electrolytic	12.75c. to 13.75c.
Copper, castings	12.50c. to 13.50c.
*Copper sheets, hot-rolled	19.125c.
*High brass sheets	17.375c.
*Seamless brass tubes	20.125c.
*Seamless copper tubes	19.875c.
*Brass rods	13.375c.
Zinc, slabs	6.75c. to 7.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	12.00c.
Lead, American pig	6.00c. to 7.00c.
Lead, bar	7.25c. to 8.25c.
Lead, sheets, cut	8.50c.
Antimony, Asiatic	18.00c. to 19.00c.
Alum., virgin, 99 per cent plus	22.50c. to 24.00c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	31.00c. to 33.00c.
Babbitt metal, commercial grade	20.00c. to 60.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 25 per cent allowed off for extras, except copper sheets and brass rods, on which allowance is 40 per cent.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	48.875c.
Tin, bar	50.875c.
Copper, Lake	12.00c. to 12.25c.
Copper, electrolytic	12.00c. to 12.25c.
Copper, castings	11.50c. to 11.75c.
Zinc, slabs	8.25c. to 8.50c.
Lead, American pig	5.50c. to 5.75c.
Lead, bar	9.00c.
Antimony, Asiatic	17.25c. to 17.75c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	50.875c.
Solder, ½ and ½	27.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.75c.	8.50c.
Copper, hvy. and wire	7.125c.	7.625c.
Copper, light and bottoms	6.125c.	6.375c.
Brass, heavy	4.25c.	4.875c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.75c.	7.25c.
No. 1 yel. brass turnings	4.75c.	5.25c.
No. 1 red brass or compos. turnings	6.50c.	7.00c.
Lead, heavy	4.00c.	4.375c.
Cast aluminum	10.625c.	11.75c.
Sheet aluminum	12.00c.	13.50c.
Zinc	2.875c.	3.125c.

Zinc

A further reduction in quotations on Thursday by the same custom smelter that has set the pace in the past brought prices down to a basis of 5.35c. per lb., New York. First-of-the-month buying, accompanied by the lower prices, boosted sales of prime Western for the short week to 1300 tons, as compared with 193 tons in the preceding week. Deliveries also showed an improvement last week, totaling 4787 tons, as against 3304 tons two weeks ago. Statistics on domestic slab zinc, all grades, for November showed another decrease in deliveries, the fourth in as many months, the month's total being 32,221 tons, in comparison with 40,345 tons in October. The slight decrease in production from 52,645 tons in October to 49,388 tons in November, was not sufficient to offset the drop in shipments and consequently stocks rose sharply to 42,984 tons, or 17,167 tons above the preceding month's position.

Lead

The market continues quiet with a modest demand for nearby deliveries at an unchanged price of 5c. per lb., New York. The flurry of buying that usually is experienced with the opening of the new month's books did not develop this month, and sales for the week were at the same level as in the preceding week.

Tin

The announcement of tin plate prices last week caused heavy buying on future positions on Friday and Saturday, but on Monday the demand died out and the market is again in the doldrums. Prices were slightly higher last week, with today's straits quotation of 44c. per lb., New York, for nearby shipment, being 1.50c. above the price of a week ago. Rumors that a substantial cut in quotas will be announced at the International Tin Control meeting strengthened prices in London, and today's cash standard quotation of £197 is about £11 over last week's price position. Domestic deliveries in November amounted to 5195 tons, or 3105 tons below the October total. World stocks at the end of November were 19,129 tons, as compared with 19,458 tons at the end of October.

IRON AND STEEL SCRAP

. . . Export buying gives strength to domestic grades.

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. . . Composite turns upward first time in 3½ months.

DECEMBER 7.—For the first time since August 24, THE IRON AGE composite scrap price staged an advance over the previous week, although it was only 16c., bringing the figure to $13.08. Prices on No. 1 heavy melting steel are unchanged at Pittsburgh and Chicago, in the absence of any real test, but at Philadelphia prices on that grade, No. 2 steel and bundles advanced 50c., largely because of export activity. Because of high bids for railroad material for export, prices have risen sympathetically 50c. to $1 a ton at Pittsburgh on these grades for domestic delivery. At New York and Boston, however, buying prices for export material are unchanged except for the substitution of a flat figure for the usual 50c. range. With continued decline in ingot operations and absence of mill buying, there is no reason to predict a strong upward movement until sales prospects for steel products become considerably brighter. Before long, the high price midsummer European cartel orders will have been liquidated, and buying will begin for last big order, $5 a ton under the previous one, tending to hold down buying prices for export.

Cincinnati

The old materials market is all but stagnant. Occasional small orders for sudden needs constitute the only new business reported. Dealers become more reluctant to make purchases and take offerings only at attractive prices. Bids remain nominal, although no definite changes were made the past week.

Chicago

For the third straight week the price of heavy melting steel is unchanged at $11.50 to $12, this being one of the few stable and reassuring factors in the Chicago steel news at the moment. Demand, however, according to brokers' reports, continues stagnant, mills evincing no interest whatever. Scrap piles at local mills are said to be quite large, it being estimated that one plant has more than 250,000 tons on the ground.

Philadelphia

This market continues to stage a private bullish move, seemingly discounting further reductions in operating rates and depressed sentiment in other important centers. Exporters have lifted prices to $15 and $14 for No. 1 and No. 2 respectively, and the Coatesville producer is taking in small lots of No. 1 at about $14.50 from local yards. In addition, Phoenix is taking a few carloads of No. 2 and stove plate, both at a mill price of $13. These 50c. advances are no more surprising than the $13 f.o.b. price paid for the 3000 tons of bundles on Budd's December list, equivalent to about $14.50 laid down at district mills.

Cleveland

The market continues lifeless, and prices have again declined 50c. a ton on nearly all grades. However, in the absence of consumer demand quotations are nominal. One local mill is taking small shipments, but Youngstown district mills are still holding up deliveries. The New York Central Railroad refused to sell the heavy melting steel offered on its scrap list last week. Its best offer for this grade is reported to have been $13.50. This railroad's borings and turnings brought $7.50 per net ton for delivery in the Buffalo district and its cast iron car wheels $13.50 per net ton. The New York Central has closed its scrap yards at Ashtabula, Ohio, for the remainder of the month at least, claiming that it is not profitable to prepare scrap at present prices.

Pittsburgh

Evidence is appearing that the scrap market is stronger, in sentiment at least. Part of this feeling is undoubtedly due to the effect of export buying. Quotations on railroad heavy melting have been advanced to a range of $14.50 to $15 on the basis of consumer buying. The strengthening in this grade, however, is being influenced by prices obtained on material for export which are understood to range between $15 and $16 a ton. No. 1 heavy melting steel continues unchanged at $13 to $13.50, and it is noted that few, if any, brokers are willing to sell at less than $13.50 a ton. Railroad specialties have advanced 50c. a ton based on a recent sale.

Buffalo

A little spotty inquiry exists for other than the steel grades. Small sales of No. 1 cupola cast have been made at around $14 for shipment outside the district. There has been more inquiry in the past week for similar grades than for three weeks previously. Dealers do not look for any more steel buying this year, and are agreed that a tonnage sale of almost any commodity would bring out a higher price than the purely nominal quoted figures

St. Louis

Dealers expect that there will be some buying of scrap iron by mills in the district before the first of the year, but not until after Christmas, when inventories will have been taken. Nothing is pending at present. Missouri Pacific Railway will sell 75 cars of scrap, including 25 cars of rails and 20 cars of melting steel, and the St. Louis Southwestern Railway will sell 13 cars of miscellaneous items during the week.

Detroit

A wave of unexpected activity carried Detroit scrap prices to higher levels the first of December when speculative buying temporarily boosted a few items about $1 a ton. A buyer outside of Detroit is reported to have laid down bundles at approximately $11.25 per ton. Before this influence made itself felt and after the excitement had subsided, bundles on automotive lists were sold for approximately $10.25.

New York

Although some feel that the market is weaker, there have been no changes of any consequence in dealers' buying prices. Shipments of export material are going forward steadily and the floating supply on barges is replenished as rapidly as it is loaded into ocean-going bottoms. The arrival of freezing weather may result in higher bids in order to attract out material under adverse working conditions. Since no No. 1 steel has been shipped out of this market for domestic consumption for some months, quotations on this are purely nominal.

Boston

During the past week Weirton came into the market for steel turnings, paying $2.60 a ton on cars, dropped its price to $2.10, and then withdrew offers, whereupon Phoenix came into the market, paying $2.50. Small tonnages of blast furnace materia' changed hands at $2.40 a ton on cars and bundled skeleton at $6.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton to delivered to consumer:

No. 1 hvy. mltng. steel	$13.00 to $13.50
Railroad hvy. mltng.	14.50 to 15.00
No. 2 hvy. mltng. steel	11.50 to 12.00
Scrap rails	14.50 to 15.00
Rails 3 ft. and under	18.00 to 18.50
Comp. sheet steel	13.00 to 13.50
Hand bundled sheets	12.00 to 12.50
Hvy. steel axle turn.	11.50 to 12.00
Machine shop turn	7.00 to 7.50
Short shov. turn.	7.00 to 7.50
Mixed bor. & turn	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Cast iron carwheels	15.00 to 15.50
Hvy. breakable cast	12.50 to 13.00
No. 1 cupola cast	16.00 to 16.50
RR. knuckles & cplrs.	17.50 to 18.00
Rail coil & leaf springs	17.50 to 18.00
Rolled steel wheels	17.50 to 18.00
Low phos. billet crops	18.00 to 18.50
Low phos. sh. bar	17.00 to 17.50
Low phos. punchings	16.00 to 16.50
Low phos. plate, hvy.	17.00 to 17.50
Low phos. plate clips	14.50 to 15.00
Steel car axles	17.50 to 18.00

PHILADELPHIA

Per gross ton to delivered to consumer:

No. 1 hvy. mltng. steel	$14.00 to $14.50
No. 2 hvy. mltng. steel	12.50 to 13.00
Hydraulic bund., new	14.00 to 14.50
Hydraulic bund., old	10.00 to 10.50
Steel rails for rolling	17.00 to 17.50
Cast iron carwheels	16.00 to 16.50
Hvy. breakable cast	14.00 to 14.50
No. 1 cast	16.00 to 16.50
Stove plate (steel wks.)	12.50 to 13.00
Railroad malleable	16.00 to 16.50
Machine shop turn	9.00 to 9.50
No. 1 blast furnace	8.00 to 8.50
Cast borings	8.50 to 9.00
Heavy axle turnings	11.00 to 11.50
No. 1 low phos. hvy.	18.00 to 18.50
Couplers & knuckles	18.00 to 18.50
Rolled steel wheels	18.00 to 18.50
Steel axles	20.00 to 20.50
Shafting	19.50 to 20.00
No. 1 RR. wrought	16.00 to 16.50
Spec. iron & steel pipe	13.00 to 13.50
No. 1 forge fire	12.00 to 12.50
Cast borings (chem.)	13.50 to 14.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$11.50 to $12.00
Auto. hvy. mltng. steel alloy free	10.00 to 10.50
No. 2 auto. steel	9.50 to 10.00
Shoveling steel	11.50 to 12.00
Hydraul. comp. sheets	10.50 to 11.00
Drop forge flashings	9.00 to 9.50
No. 1 busheling	10.50 to 11.00
Rolled carwheels	15.00 to 15.50
Railroad tires, cut	15.25 to 15.75
Railroad leaf springs	16.00 to 16.50
Steel coup. & knuckles	15.00 to 15.50
Axle turnings	11.00 to 11.50
Coil springs	16.50 to 17.00
Axle turn. (elec.)	11.50 to 12.00
Low phos. punchings	15.00 to 15.50
Low phos. plates, 12 in. and under	14.50 to 15.00
Cast iron borings	7.00 to 7.50
Short shov. turnings	7.50 to 8.00
Machine shop turn	6.00 to 6.50
Rerolling rails	14.25 to 14.75
Steel rails under 3 ft.	14.50 to 15.00
Steel rails under 2 ft.	15.00 to 15.50
Angle bars, steel	14.25 to 14.75
Cast iron carwheels	14.25 to 14.75
Railroad malleable	13.75 to 14.25
Agric. malleable	11.25 to 11.75
	Per Net Ton
Iron car axles	18.50 to 19.00
Steel car axles	16.50 to 17.00
No. 1 RR. wrought	9.50 to 10.00
No. 2 RR. wrought	10.25 to 10.75
No. 2 busheling, old	4.75 to 5.25
Locomotive tires	14.75 to 15.25
Pipes and flues	8.25 to 8.75
No. 1 machinery cast	11.25 to 11.75
Clean auto. cast	11.00 to 11.50
No. 1 railroad cast	10.25 to 10.75
No. 1 agric. cast	10.25 to 10.75
Stove plate	8.00 to 8.50
Grate bars	8.00 to 8.50
Brake shoes	7.50 to 8.00

YOUNGSTOWN

Per gross ton to delivered to consumer:

No. 1 hvy. mltng. steel	$13.00 to $13.50
Hydraulic bundles	12.50 to 13.00
Machine shop turn	10.00 to 10.50

CLEVELAND

Per gross ton to delivered to consumer:

No. 1 hvy. mltng. steel	$12.00 to $12.50
No. 2 hvy. mltng. steel	11.00 to 11.50
Comp. sheet steel	11.50 to 12.00
Light bund. stampings	8.50 to 9.00
Drop forge flashings	11.00 to 11.50
Machine shop turn	7.00 to 7.50
Short shov. turn.	8.50 to 9.00
No. 1 busheling	11.00 to 11.50
Steel axle turnings	9.50 to 10.00
Low phos. billet and bloom crops	18.50 to 19.50
Cast iron borings	8.50 to 9.00
Mixed bor. & turn.	8.50 to 9.00
No. 2 busheling	8.50 to 9.00
No. 1 cast	16.50 to 17.00
Railroad grate bars	8.00 to 8.50
Stove plate	8.00 to 8.50
Rails under 3 ft.	18.00 to 18.50
Rails for rolling	16.00 to 16.50
Railroad malleable	16.00 to 16.50
Cast iron carwheels	15.00 to 15.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel	$13.00 to $13.50
No. 2 hvy. mltng. steel	11.50 to 12.00
Scrap rails	13.00 to 13.50
New hvy. b'ndled sheet	11.50 to 12.00
Old hydraul. bundles	10.50 to 11.00
Drop forge flashings	11.50 to 12.00
No. 1 busheling	11.50 to 12.00
Hvy. axle turnings	11.50 to 12.00
Machine shop turn	7.00 to 7.50
Knuckles & couplers	16.50 to 17.00
Coil & leaf springs	16.50 to 17.00
Rolled steel wheels	16.50 to 17.00
Low phos. billet crops	17.50 to 18.00
Shov. turnings	9.50 to 10.00
Mixed bor. & turn	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Steel car axles	16.50 to 17.00
No. 1 machinery cast	15.00 to 15.50
No. 1 cupola cast	14.00 to 14.50
Stove plate	12.00 to 12.50
Steel rails under 3 ft.	17.00 to 17.50
Cast iron carwheels	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Chemical borings	10.50 to 11.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting	$13.00 to $13.50
No. 1 hvy. melting	13.00 to 13.50
No. 2 hvy. melting	12.00 to 12.50
No. 1 locomotive tires	16.00 to 16.50
Misc. stand.-sec. rails	13.00 to 13.50
Railroad springs	15.00 to 15.50
Bundled sheets	8.00 to 8.50
No. 1 busheling	7.00 to 7.50
Cast bor. & turn	6.00 to 6.50
Rails for rolling	13.50 to 14.00
Machine shop turn	6.00 to 6.50
Heavy turnings	8.50 to 9.00
Steel car axles	19.50 to 20.00
Iron car axles	21.50 to 22.00
No. 1 RR. wrought	8.00 to 8.50
No. 2 RR. wrought	13.00 to 13.50
Steel rails under 3 ft.	16.00 to 16.50
Steel angle bars	14.50 to 15.00
Cast iron carwheels	16.50 to 17.00
No. 1 machinery cast	12.75 to 13.25
Railroad malleable	15.00 to 15.50
No. 1 railroad cast	13.25 to 13.75
Stove plate	9.00 to 9.50
Agricul. malleable	10.00 to 10.50
Grate bars	11.25 to 11.75
Brake shoes	10.00 to 10.50

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$9.50 to $10.00
No. 2 hvy. mltng. steel	7.50 to 8.00
Scrap rails for mltng.	14.50 to 15.00
Loose sheet clippings	6.00 to 6.50
Hydrau. b'ndled sheets	9.50 to 10.00
Cast iron borings	3.50 to 4.00
Machine shop turn	4.00 to 4.50
No. 1 busheling	8.00 to 8.50
No. 2 busheling	3.00 to 3.50
Rails for rolling	16.50 to 17.00
No. 1 locomotive tires	13.00 to 13.50
Short rails	17.00 to 17.50
Cast iron carwheels	11.50 to 12.00
No. 1 machinery cast	10.50 to 11.00
No. 1 railroad cast	9.00 to 9.50
Burnt cast	5.50 to 6.00
Stove plate	5.50 to 6.00
Agricul. malleable	10.50 to 11.00
Railroad malleable	12.50 to 13.00
Mixed hvy. cast	7.50 to 8.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel	$16.00 to $16.50
Scrap steel rails	17.00
Short shov. turnings	8.50
Stove plate	10.50
Steel axles	18.00 to 19.00
Iron axles	15.50 to 18.00
No. 1 RR. wrought	13.00 to 15.00
Rails for rolling	18.00 to 20.00
No. 1 cast	16.00 to 18.00
Tramcar wheels	16.00 to 18.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$9.00 to $9.50
No. 2 hvy. mltng. steel	8.00 to 8.50
Borings and turnings	5.75 to 6.25
Long turnings	5.25 to 5.75
Short shov. turnings	6.25 to 6.75
No. 1 machinery cast	11.75 to 12.25
Automotive cast	12.75 to 13.25
Hvy. breakable cast	10.25 to 10.75
Hydraul. comp. sheets	10.00 to 10.50
Stove plate	7.50 to 8.00
New factory bushel	9.00 to 9.50
Old No. 2 busheling	5.00 to 5.50
No. 2 busheling (black fender stock)	Nominal
Sheet clippings	6.50 to 7.00
Flashings	8.50 to 9.00
Low phos. plate scrap	10.50 to 11.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel	Nominal
No. 2 hvy. mltng. steel	$8.50 to $9.00
Hvy. breakable cast	9.50 to 10.00
No. 1 machinery cast	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	8.50 to 9.00
Steel car axles	19.00 to 19.50
Shafting	16.00 to 16.50
No. 1 RR. wrought	11.00 to 11.50
No. 1 wrought long	10.00 to 10.50
Spec. iron & steel pipe	9.00 to 9.50
Rails for rolling	16.00 to 16.50
Clean steel turnings	5.00 to 5.50
Cast borings	5.00 to 5.50
No. 1 blast furnace	5.00 to 5.50
Cast borings (chem.)	10.00 to 10.50
Unprepar. yard scrap	7.50 to 8.00
Per gross ton, delivered local foundries:	
No. 1 machn. cast	$15.50 to $16.00
No. 2 cast	11.00 to 11.50

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel	$13.30 to $13.80
Scrap rails	13.30 to 13.80
No. 2 steel	12.30 to 12.80
Breakable cast	12.50 to 13.00
Machine shop turn	2.50
Mixed bor. & turn	2.40
Bund. skeleton long	6.00
Shafting	17.50 to 18.00
Cast bor. chemical	8.00 to 8.50
Per gross ton delivered consumers' yards:	
Textile cast	$15.50 to $16.00
No. 1 machine cast	15.50 to 16.00

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel	$10.50 to $11.00
No. 2 hvy. mltng. steel	9.50 to 10.00

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel	$14.50	$14.00
No. 2 hvy. mltng. steel	13.50	13.00
Mixed dealers steel	12.50	12.00
Scrap pipe	11.75	11.50
Steel turnings	9.75	9.50
Cast borings	11.00	10.50
Machinery cast	18.00	17.00
Dealers cast	16.00	15.00
Stove plate	13.00	11.90

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel	$13.50
No. 2 hvy. mltng. steel	12.00
No. 2 cast	11.00
Stove plate	8.50 to 9.00
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel	$14.00
No. 2 hvy. mltng. steel	13.00
Rails (scrap)	14.00
Philadelphia, delivered alongside boats. Port Richmond	
No. 1 hvy. mltng. steel	$14.50 to $15.00
No. 2 hvy. mltng. steel	13.50 to 14.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$37.00
Forging quality	43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	2.10c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Gross Ton
F.o.b. Pittsburgh or Cleveland	$47.00
F.o.b. Chicago, Youngstown or Anderson, Ind.	48.00
F.o.b. Worcester, Mass.	49.00
F.o.b. Birmingham	50.00
F.o.b. San Francisco	56.00
F.o.b. Galveston	53.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh	2.45c.
F.o.b. Chicago or Gary	2.50c.
F.o.b. Duluth	2.60c.
Del'd Detroit	2.60c.
F.o.b. Cleveland	2.50c.
F.o.b. Buffalo	2.55c.
Del'd Philadelphia	2.74c.
Del'd New York	2.79c.
F.o.b. Birmingham	2.60c.
F.o.b. cars dock Gulf ports	2.85c.
F.o.b. cars Pacific Ports	3.00c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	2.30c
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	2.35c.
F.o.b. Buffalo	2.40c.
F.o.b. Birmingham	2.45c.
F.o.b. cars dock Gulf ports	2.70c.
F.o.b. cars dock Pacific ports	2.85c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.45c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.50c.
Del'd Detroit	2.60c.
F.o.b. cars dock Gulf ports	2.85c.
F.o.b. cars dock Pacific ports	2.85c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributers)

F.o.b. Pittsburgh	2.30c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.35c.
F.o.b. cars dock Gulf ports	2.70c.
F.o.b. cars dock Pacific ports	2.70c.

Iron

F.o.b. Chicago	2.40c.
F.o.b. Pittsburgh (refined)	3.60c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.90c.
F.o.b. Cleveland, Chicago and Gary	2.95c.
F.o.b. Buffalo	3.00c.
F.o.b. Detroit	2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago or Gary	2.30c.
Del'd Cleveland	2.445c.
F.o.b. Coatesville or Spar. Pt.	2.35c.
Del'd Philadelphia	2.435c.
Del'd New York	2.54c.
F.o.b. Birmingham	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.
Wrought iron plates, f.o.b. Pittsburgh	3.80c.

Floor Plates

	Base per Lb.
F.o.b. Pittsburgh	3.50c.
F.o.b. Chicago	3.55c.
F.o.b. Coatesville	3.60c.
F.o.b. cars dock Gulf ports	3.90c.
F.o.b. cars dock Pacific ports	4.05c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	2.25c.
F.o.b. Chicago	2.30c.
Del'd Cleveland	2.445c.
F.o.b. Buffalo or Bethlehem	2.35c.
Del'd Philadelphia	2.455c.
Del'd New York	2.5125c.
F.o.b. Birmingham (standard)	2.40c.
F.o.b. cars dock Gulf ports	2.65c.
F.o.b. cars dock Pacific ports	2.80c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Chicago or Buffalo	2.70c.
F.o.b. cars dock Gulf or Pacific Coast ports	3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$42.50
Angle bars, per 100 lb.	2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton	$43.00
Light rails (from rail steel) per gross ton	42.00

	Base per Lb.
Spikes	3.15c.
Tie plates, steel	2.30c.
Tie plates, Pacific Coast ports	2.40c.
Track bolts, to steam railroads	4.35c.
Track bolts, to jobbers, all sizes (per 100 counts)	65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	2.40c.
No. 10, f.o.b. Gary	2.50c.
No. 10, del'd Detroit	2.60c.
No. 10, del'd Philadelphia	2.69c.
No. 10, f.o.b. Granite City	2.60c.
No. 10, f.o.b. Birmingham	2.55c.
No. 10, f.o.b. cars dock Pacific ports	2.95c.
No. 10 wrought iron, P'gh	4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	3.15c.
No. 24, f.o.b. Gary	3.25c.
No. 24, del'd Detroit	3.35c.
No. 24, del'd Philadelphia	3.44c.
No. 24, f.o.b. Granite City	3.35c.
No. 24, f.o.b. Birmingham	3.30c.
No. 24, f.o.b. cars dock Pacific ports	3.80c.
No. 24, wrought iron, Pittsburgh	5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	3.10c.
No. 10 gage, f.o.b. Gary	3.20c.
No. 10 gage, f.o.b. Detroit	3.30c.
No. 10 gage, del'd Philadelphia	3.39c.
No. 10, f.o.b. Granite City	3.30c.
No. 10 gage, f.o.b. Birmingham	3.25c
No. 10 gage, f.o.b. cars dock Pacific ports	3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	3.55c.
No. 20 gage, f.o.b. Gary	3.65c.
No. 20 gage, del'd Detroit	3.75c.
No. 20 gage, del'd Philadelphia	3.84c.
No. 20, f.o.b. Granite City	3.75c.
No. 20 gage, f.o.b. Birmingham	3.70c.
No. 20 gage, f.o.b. cars, dock Pacific ports	4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.80c.
No. 24, f.o.b. Gary	3.90c.
No. 24, del'd Philadelphia	4.09c.
No. 24, f.o.b. Granite City	4.00c.
No. 24, f.o.b. Birmingham	3.95c.
No. 24, f.o.b. cars, dock, Pacific ports	4.40c.
No. 24, wrought iron, Pittsburgh	6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

	Base per Lb.
Field grade	3.35c.
Armature	3.70c.
Electrical	4.20c.
Special Motor	5.10c.
Special Dynamo	5.80c.
Transformer	6.30c.
Transformer Special	7.30c.
Transformer Extra Special	7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extras plus 25c per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	4.10c.
F.o.b. Gary	4.20c.
F.o.b. cars, dock, Pacific ports	480c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.50c.
No. 20, f.o.b. Gary	3.60c.
No. 20, f.o.b. Granite City	3.70c.
No. 20, f.o.b. cars dock Pacific ports	4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb.	3.30c.
No. 28, Gary	3.40c.
No. 28, f.o.b. Granite City	3.50c.
No. 28, cars dock Pacific ports, boxed	4.175c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. Pittsburgh district mill	$5.35
Standard cokes, f.o.b. Gary	5.45
Standard coke, f.o.b. Granite City	5.55

Special Coated Manufacturing Ternes

	Base per Box
F.o.b. Pittsburgh	$4.65
F.o.b. Gary	4.75
F.o.b. Granite City	4.85

Roofing Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

Hot-rolled Hoops, Bands, Strip and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., Pittsburgh	2.40c.
All widths up to 24 in., Chicago	2.50c.
All widths up to 24 in., del'd Detroit	2.60c.
All widths up to 24 in., Granite City	2.60c.
All widths up to 24 in., Birmingham	2.55c.
Cooperage stock, Pittsburgh	2.50c.
Cooperage stock, Chicago	2.60c.

Cold-Rolled Strip*

	Base per Lb.
F.o.b. Pittsburgh	3.20c.
F.o.b. Cleveland	3.20c.
Del'd Chicago	3.48c.
F.o.b. Worcester	3.40c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

		Pittsburgh and Cleveland	Worcester
Carbon	0.25-0.50%	3.20c.	3.40c.
Carbon	.51- .75	4.45c.	4.65c.
Carbon	.76-1.00	6.30c.	6.50c.
Carbon	Over 1.00	8.50c.	8.70c.

Fender Stock

No. 14, Pittsb'gh or Cleveland	3.45c.
No. 20, Pittsb'gh or Cleveland	3.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	2.90c.
Galvanized wire	2.95c.
Spring wire	3.50c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.75
Smooth coated nails	$2.75
Cut nails, carloads	$3.60

	Base per 100 Lb.
Annealed fence wire	$3.15
Galvanized fence wire	3.55
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbless wire	3.40
Woven wire fence, base column.	.75
Single loop bale ties, base col.	.63

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh, except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton over Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	52	31	¼ & ⅜	+13	+35
¼ to ⅜	55	38½	½	20	1½
½	59½	49	¾	26	8
¾	62½	53	1 & 1¼	30	14
1 to 3	64½	55½	1½	34	16½
			2	33½	16

Lap Weld

2	57	47½	26½	10
2½ & 3	60	50½	2½ to 3½	27½ 12½
3½ to 6	62	52½	4	29½ 16
7 & 8	61	50½	4½ to 8	28½ 15
9 & 10	60½	50	9 to 12	24½ 10
11 & 12	59½	49		

Butt Weld, extra strong, plain ends

⅛	50½	36½	¼ & ⅜	+14 +48
¼ to ⅜	52½	40½	½	21 4
½	57½	48½	¾	27 10
¾	61½	52½	1 to 2	34 17½
1 to 3	63	55		

Lap Weld, extra strong, plain ends

2	55	46½	2	29½ 13½
2½ & 3	59	50½	2½ to 4	35 20½
3½ to 6	62½	54	4½ to 6	33½ 19
7 & 8	61½	51	7 & 8	34½ 19½
9 & 10	60½	50	9 to 12	28 15½
11 & 12	59½	49		

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 9.46	$ 8.41
1¼ in. o.d.	13 B.W.G.	11.21	9.96
1½ in. o.d.	13 B.W.G.	12.38	11.00
1¾ in. o.d.	13 B.W.G.	14.09	12.51
2 in. o.d.	13 B.W.G.	15.78	14.02
2¼ in. o.d.	13 B.W.G.	17.60	15.63
2½ in. o.d.	12 B.W.G.	19.37	17.21
2¾ in. o.d.	12 B.W.G.	21.22	18.85
2¾ in. o.d.	12 B.W.G.	22.49	19.98
3 in. o.d.	12 B.W.G.	23.60	20.97
4½ in. o.d.	10 B.W.G.	45.19	40.15
3½ in. o.d.	11 B.W.G.	29.79	26.47
4 in. o.d.	10 B.W.G.	36.96	32.83
5 in. o.d.	9 B.W.G.	56.71	50.38
6 in. o.d.	7 B.W.G.	87.07	77.35

Extra for less-carload quantities:

40,000 lb. or ft. or over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham.	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	56.00
F.o.b. dock, Seattle	56.00
4-in. f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	59.00

Class "A" and gas pipe, $3 extra
4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $46, Birmingham, and $54 delivered Chicago; and 4-in. pipe, $49, Birmingham, and $58 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts:	
½ in. x 6 in. and smaller	65 and 5*
Larger and longer up to 1 in.	60 and 10*
1⅛ in. and larger	60 and 5*
Lag bolts	60 and 10*
Plow bolts, Nos. 1, 2, 3 and 7	65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped:	
⅛ in. and smaller	65
9/16 in. to 1 in. inclusive	60 and 5
1⅛ in. and larger	60

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.:	
½ in. and smaller	60 and 10
9/16 in. to 1 in. inclusive	60 and 5
1⅛ in. and larger	60
Stove bolts in packages, nuts attached	70
Stove bolts in packages, with nuts separate	70 and 10
Stove bolts in bulk	80

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets
(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.60
F.o.b. Chicago or Birmingham	3.70

Small Rivets
(7/16-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	65 and 5
F.o.b. Cleveland	65 and 5
F.o.b. Chicago and Birmingham	65 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more.)

	Per Cent Off List
Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	3.00c.
Delivered, Detroit	3.15c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	0.75
2300 (3½% Nickel)	1.55
2500 (5% nickel)	$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum).	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum).	0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.60c. base per lb. Delivered Detroit, 3.75c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	80c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	22s. 6d. to 23s.
Steel bars, open-hearth	£11
Beams, open-hearth	£11 2s. 6d.
Channels, open-hearth	£11 7s. 6d.
Angles, open-hearth	£11 2s. 6d.
Black sheets, No. 24 gage	£15
Galvanized sheets, No. 24 gage	£18 15s.

CONTINENTAL

Per Gross Ton, Gold £,
f.o.b. Continental Ports

Billets, Thomas	£5 7s. 6d.
Wire rods, No. 5 B.W.G.	£6 10s.
Steel bars, merchant	£6
Sheet bars	£5 8s. 6d.
Plate ¼ in. and up	£7 7s.
Plate 3/16 in. and 5 mm.	£7 13s.
Sheet, ⅛ in.	£8 9s. 6d.
Beams, Thomas	£5 8s.
Angles (Basic)	£6 2s. 6d.
Hoops and strip, base	£6 10s.

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Per Net Ton
Plates	3.70c.
Structural shapes	3.70c.
Soft-steel bars and small shapes	3.80c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$4.48
Spikes, large .....1 to 24 kegs	$3.75
	Per Cent Off List
Track bolts, all sizes per 100 count	55
Machine bolts, 100 count	**
Carriage bolts, 100 count	**
Nuts, all styles, 100 count	**
Large rivets, base per 100 lb.	$4.35
Wire, black, soft ann'l'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 3999 lb.

* Delivered in Pittsburgh switching district.

** Prices on application.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	$4.40
Track bolts (keg lots)	5.05
Rivets, structural (keg lots)	**4.95
Rivets, boiler (keg lots)	**5.05
	Per Cent Off List
Machine bolts and carriage bolts, ½ in. and smaller	60
Lag screws	*55 and 5
Hot-pressed nuts, sq. and hex., tap or blank, ½ by 6 in. and smaller	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72½
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	$4.00 off list
Black ann'l'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	$4.55
Com. wire nails, 15 kegs or more, per keg	$3.20
Cement c't'd nails, 15 kegs or more, per keg	$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

* These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

** Base at 100 lb.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	4.00c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. charcoal	7.25 to 7.50c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled: strip, soft and quarter hard	3.92c.
Hoops	4.32c.
Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'l'd sheets (No. 24*	4.50 to 4.82c.
Galvanized sheets (No. 24*)	5.00c.
Long terne sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.50c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) for quantities 400 to 1499 lb.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretcher leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, ⅛ in. and heavier	5.60c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.25c.
Wire, galv. (No. 9)	4.60c.
Tire steel, 1 x ½ in. and larger	4.61c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	3.25c.
	Per Cent Off List
Machine bolts, square head and nut: All diameters, Prices on application	
Carriage bolts, cut thread: All diameters. Prices on application	

* For 1500 lb. or more; add 0.25c. on smaller lots. No. 28 and lighter, 36 in. wide, 20c. per 100 lb. higher.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.54c.
Structural rivets	5.29c.
Boiler rivets	5.39c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	50
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, nuts; all quantities	60

* No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	3.90c.
*Structural shapes	3.90c.
*Soft steel bars, small shapes, iron bars (except bands)	4.00c.
‡Reinforc. steel bars, sq. twisted and deformed	3.53c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.35c.
*Steel bands, No. 12 and 3/16 in. incl.	4.10c.
*Spring steel	5.50c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
‡Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	4.00c.
*Diam. pat. floor plates, ¼ in.	5.25c.

These prices are for delivery in Philadelphia trucking area.

* Base prices subject to deduction on orders aggregating 4000 lb. or over.

† For 25 bundles or over.

‡ For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.
Soft steel bars	3.75c.
‡Reinforc. steel bars	2.60c.
‡Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'l'd wire, per 100 lb.	$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95
	Per Cent Off List
Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count ½ in. and smaller	65 and 5
9/16 in. to 1 in.	60 and 10

† Outside delivery 10c. less.

* For 5000 lb. or less.

‡ Plus switching and carriage charges and quantity differentials up to 50c.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.95c.
Floor plates	5.55c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$3.48
Com. wire nails, base per keg:	
Any quantity less than carload	3.20
Cement c't'd nails, base 100-lb. keg	3.50
Chain, lin. per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$21.80
4-in.	52.45
Lap-welded steel boiler tubes, 2-in.	20-73
4-in.	48.41

BUFFALO

	Base per Lb.
Plates	3.92c.
Floor plates	5.52c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg	$3.26
Black wire, base per 100 lb. (2500-lb. lots or under)	4.55c.
(Over 2500 lb.)	4.45c.

BOSTON

	Base per Lb.
Channels, angles	4.20c.
Tees and zees, under 3 in.	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, ¼ thick and heavier	4.08c.
Floor plates, diamond pattern	5.13c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.49c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets (No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)*	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.

Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.

*Under 400 lb., .50c. over base, 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	5.16c.
Boiler rivets, cone head (keg lots)	5.26c.
Track spikes (keg lots)	4.61c.
Track bolts (keg lots)	5.81c.
Black annealed wire (No. 6 to No. 9 incl.)	4.05c.
Com. wire nails and cement coated nails 1 to 14 kegs	3.25c.

	Per Cent Off List
Machine bolts and carriage bolts, ½x6 and smaller or shorter	65
Larger and longer up to 1 in., diam.	60–5
1⅛ in. and larger	60
Coach and lag screws	60–5
Hot-pressed nuts, sq. and hex. tapped or blank, 1–199 lb.	50
200 lb. and over: ½ in. and smaller	62½
9/16 to 1 in.	60
1⅛ in. and over	50

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BIRMINGHAM

Bars and bar shapes	$3.85 base	
Structural shapes and plates	3.75	"
Hot rolled sheets No. 10 ga.	3.80	"
Hot rolled sheets No. 24 ga.	4.40	" 3500 lb. and over
Galvanized sheets No. 24 ga.	5.05	" 3500 lb. or more
Strip	4.05	"
Reinforcing bars	3.85	"
Floor plates	5.96	"
Cold finished bars	4.91	"

Machine and carriage bolts .....50 & 10 off list

Rivets (structural) $4.60 base

On plates, shapes, bars, hot rolled strip, heavy hot rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

BALTIMORE

	Base per Lb.
Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.16c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates ¼ in. and heavier	5.50c.
Galvanized sheets, No. 24, 100 bdls. or more	$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb. All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

	Base per Lb.
Mild steel bars	4.21c.
Iron bars	4.21c.
Reinforcing bars	4.21c.
Reinforcing shapes	4.11c.
Plates	4.11c.
Hot-rolled sheets No. 10	4.16c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.76c.
Steel bands	4.41c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

	Base per Lb.
Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	5.15c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	55

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	$3.55
Bolts and nuts, per cent off list	60

PACIFIC COAST

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	3.625c.
Hot-rolled annealed sheets (No. 24)	5.15c.	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	$3.40	$3.40	$3.40

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00

5 per cent trade discount on fire clay brick, except for New Jersey, quoted at net price.

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50

5 per cent trade discount on silica brick.

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

	Per Net Ton
Standard f.o.b. Baltimore and Chester	$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass. $25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md. 25.00
Delivered Brooklyn 27.47
Delivered Newark or Jersey City 26.53
Delivered Philadelphia 25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill. 24.00
F.o.b. Jackson, Ohio 25.75
Delivered Cincinnati 24.27
F.o.b. Duluth 24.50
F.o.b. Provo, Utah 22.00
Delivered San Francisco, Los Angeles or Seattle 26.50
F.o.b. Birmingham* 20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 5c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass. $25.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md. 24.50
F.o.b. Buffalo 23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill. 23.50
Delivered Cincinnati 24.61
Delivered Canton, Ohio 24.89
Delivered Mansfield, Ohio 25.44
F.o.b. Jackson, Ohio 25.50
F.o.b. Birmingham 19.00

Bessemer

F.o.b. Everett, Mass. $26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa. 26.00
Delivered Boston Switching District 26.50
Delivered Newark or Jersey City 27.53
Delivered Philadelphia 26.76
F.o.b. Buffalo and Erie, Pa., and Duluth 25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago .. 24.50
F.o.b. Birmingham 25.00
Delivered Cincinnati 25.61
Delivered Canton, Ohio 25.89
Delivered Mansfield, Ohio 26.44

Low Phosphorus

Basing points: Birdsboro, Pa. Steelton, Pa., and Standish, N. Y. $28.50

Gray Forge

Valley or Pittsburgh furnace ... $23.50

Charcoal

Lake Superior furnace $27.00
Delivered Chicago 30.24

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75 ..... $26.50
No. 2 fdy., sil. 1.75 to 2.25 ..... 25.50
Malleable 26.00
Basic 25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75 ..... $27.50
No. 2 fdy., sil. 1.75 to 2.25 ..... 27.00
Malleable 27.50
Basic 27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $102.50

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21% $33.00
F.o.b. New Orleans 33.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads) $69.50
50% (ton lots) 77.00
75% (carloads) 126.00
75% (ton lots) 136.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% $27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton

10.00 to 10.50% $33.50
10.51 to 11.00% 34.00
11.01 to 11.50% 34.50
11.51 to 12.00% 35.00
12.01 to 12.50% 35.50
12.51 to 13.00% 36.00
13.01 to 13.50% 36.50
13.51 to 14.00% 37.00
14.01 to 14.50% 37.50
14.51 to 15.00% 38.00
15.01 to 15.50% 38.50
15.51 to 16.00% 39.00
16.01 to 16.50% 39.50
16.51 to 17.00% 40.00

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally $1.80
Ferrotungsten, lots of 500 lbs., nominally 1.85
Ferrotungsten, smaller lots, nominally 1.90
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads and contract ..... 10.50c.*
Ferrochromium, 2% carbon ..... 16.50c. to 17.00c.*
Ferrochromium, 1% carbon ..... 17.50c. to 18.00c.*
Ferrochromium, 0.10% carbon ..... 19.50c. to 20.00c.*
Ferrochromium, 0.06% carbon ..... 20.00c. to 20.50c.*
Ferrovanadium, del. per lb. contained V. ..... $2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y. $2.50*
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton $142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton $157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton 63.50
Ferrophosphorus, electric, 24% in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn. 80.00
Ferromolybdenum, per lb. Mo. del ..... 95c.
Calcium molybdate, per lb. Mo del ..... 80c.
Silico spiegel, per ton, f.o.b. furnace, carloads $45.00
Ton lots or less, per ton 50.00
Silico-manganese, gross ton, delivered.
3% 101.50
2.50% carbon grade 106.50
2% carbon grade 111.50
1% carbon grade 121.50

* Spot prices are $5 a ton higher. Spot premium on 75 per cent ferrosilicon is $10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50% $5.25
Old range, non-Bessemer, 51.50% 5.10
Mesabi, Bessemer, 51.50% 5.10
Mesabi, non-Bessemer, 51.50% .. $4.95
High phosphorus, 51.50% 4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal. 17.00c.
Iron, low phos., Swedish, average, 68½% iron ..... Nominal
Iron, basic or foundry, Swedish, aver. 65% iron ..... Nominal
Iron, basic or foundry, Russian, aver. 65% iron ..... Nominal
Man., Caucasian, washed 52% ..... 50c.
Man., African, Indian, 44-48% ..... Nominal
Man., African, Indian, 49-51% ..... Nominal
Man., Brazilian, 46 to 48½% ..... Nominal

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered $22.50
Tungsten, domestic, scheelite delivered ..... $23.50 to $25.50
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton:
South African (low grade) $16.00
Rhodesian, 45% 22.00
Rhodesian, 48% 25.50
Turkish, 48-49% ..... 25.00 to $26.00
Turkish, 45-46% ..... 23.00 to 23.50
Turkish, 44% ..... 19.00 to 19.50
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:
50% ..... $25.50 to $26.50
48-49% ..... 24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail $20.00
Domestic, barge and rail 21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines 22.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid 24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines 31.50

FUEL OIL *Per Gal.*

F.o.b. Bayonne or Baltimore, No. 3 distillate ..... 5.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial ..... 5.25c.
Del'd Ch'go, No. 3 industrial ... 4.15c.
Del'd Ch'go, No. 5 industrial ... 4.00c.
Del'd Cleve'd, No. 3 distillate .. 5.875c.
Del'd Cleve'd, No. 4 industrial . 5.75c.
Del'd Cleve'd, No. 5 industrial 4.625c.

COKE AND COAL

Coke *Per Net Ton*

Furnace, f.o.b. Connellsville, Prompt ..... $4.00 to $4.25
Foundry, f.o.b. Connellsville, Prompt ..... 5.00 to 6.25
Foundry, by-product, Chicago ovens 10.25
Foundry, by-product, del'd New England 12.50
Foundry, by-product, del'd Newark or Jersey City ..... 10.88 to 11.40
Foundry, by-product, Philadelphia 10.95
Foundry, by-product, delivered Cleveland ... 11.05
Foundry, by-product, delivered Cincinnati .. 10.50
Foundry, Birmingham .. 7.50
Foundry, by-product, del'd St. Louis industrial district ..... 11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports 14.75

Coal *Per Net Ton*

Mine run steam coal, f.o.b. W. Pa. mines .. $1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa. ..... 1.75 to 1.90
Gas coal, ¾-in. f.o.b. Pa. mines ..... 2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines ..... 1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines ..... 1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines ..... 1.20 to 1.45

NIAGARA
BRAND
FERRO - ALLOYS

For High Quality Steels

FERRO SILICON
ALL GRADES

FERRO CHROMIUM
HIGH CARBON

FERRO CHROMIUM
LOW CARBON

FERRO MANGANESE

SILICO MANGANESE

PITTSBURGH METALLURGICAL CO., Inc.

NIAGARA FALLS, N. Y.

Sales Offices: NEW YORK—30 Church St. ● PITTSBURGH—Oliver Bldg. ● CLEVELAND—Hanna Bldg.

THIS WEEK'S MACHINE . . .TOOL ACTIVITIES. . .

. . . Further decline in domestic business seen, following November volume off considerably from October.

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. . . Foreign sales retard, but do not offset, drop in local trade.

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. . . U. S. Navy lining up equipment for torpedo plant at Alexandria, Va.

Chicago

WITH November business off as much as 25 to 35 per cent from October, machine tool sellers are belatedly falling into line with other sufferers from the current recession in industrial activity. One seller reports a November reduction in small tool sales amounting to 50 per cent of his September volume, while October showed a decrease of only a third. Most plants in this district are still operating fairly well, with a few notable exceptions, of course, on the backlogs built up during the spring and summer months. The trade in general feels that the first of the year will see a favorable turn in conditions, although the improvement likely will be slow. Prospects for sales to railroads, which are badly in need of new equipment of all kinds, hinge on their being granted an increase in freight rates. Several of the roads have asked for estimates for their 1938 budgets, but no definite commitments have been made. The Monon is reported to have a list comprising some 20 items before the trade for the third time, it having come up in the spring and been withdrawn twice meanwhile. Deliveries are improving generally, but some plants are still not able to ship machines before March and April. No suggestion of lower prices has been made.

Cleveland

THE largest machine tool inquiry that has appeared in this market for some time has been sent out by the Republic Steel Corp. for seven large tools for its Corrigan, McKinney works in Cleveland. Its list includes an 18, 24, and 30-in. geared head engine lathe, a 6-ft. radial drill, 36-in. openside planer, a turret lathe with a capacity for 4-in. bar stock and a drill press to handle 1¼-in. pipe taps.

Machine tool sales continue very light. Dealers report a fair amount of pending business, but in nearly all cases are being advised by the prospective purchasers that they will not buy any equipment before January. Deliveries are easing up considerably on some lines. One leading lathe manufacturer can now take orders for some models for shipment within four weeks.

Pittsburgh

MACHINE tool sales in the past week show little, if any, change from a week ago. Dealers are more or less marking time until after the turn of the year. Some unexpected orders have been received recently, however, from customers making a last minute effort to use up unexpended appropriations. Activity during the last few weeks is not quite up to the tempo of a month ago. Most inquiries being received at this time involve data for potential 1938 purchases. Deliveries continue slightly easier with some manufacturers making headway on backlogs. Steel mill equipment manufacturers are still operating at top speed, but sales of miscellaneous items have slowed up some recently.

Cincinnati

FURTHER decline in domestic ordering of machinery in this district was offset by increase in foreign business the past week, holding current averages almost stationary for the third successive week. In some instances, however, the foreign demand is still well below that of domestic users, but the most active tools are experiencing a greater volume of export business. Lathes were in the lead on total volume, with several substantial multiple unit orders reported, but particulars were withheld. Milling machinery and grinders are still near the leaders while shaping and shearing tools are also fairly active. Drilling machinery is in a noticeably quiet market with only a few orders being reported weekly. Heavy machinery is still in sufficient demand to reflect steady consumer interest.

Market averages are difficult to approximate since the larger orders are of the undisclosed variety, but based upon reports of business and the general attitude of the trade a figure of about 45 per cent of capacity would not be far off. Production is being steadily maintained at a trifle above the half-way mark, since most plants are still clearing backlogs and extending themselves to meet delivery dates.

New York

NEW business placed thus far in December is spotty, coming from a limited number of sources, and as anticipated last week, it still appears that the month will see the lowest number of orders booked this year. There is a common tendency of buyers to withhold commitments, and, if there are any unexpended appropriations for machinery at year's end, they are being withheld. Wright Aeronautical Corp. received two War Department engine awards, totaling $2,044,490, and Pratt & Whitney Aircraft Division received an order for 43 engines at $447,328, but neither company has been in the market for machinery in recent months. The Washington Navy Yard is getting quotations on machinery for making torpedoes at the Alexandria, Va., shops, which have been closed for some years. Approximately $400,000 of equipment is involved, mostly hand and automatic screw machines. This rehabilitated plant will supplement the torpedo station at Newport, R. I.

St. Louis

THE St. Louis-San Francisco Railway has asked the Federal Court at St. Louis for authority to expend $23,669 for new shop machinery during 1938, as follows: one Murchey pipe threading machine, $2690; three portable type size 300-amp. welding machines, $2280; one 300-amp. welding machine, $749; make and install air reservoir at air compressor room, $4522; one 1000-lb. capacity air hoist with top hook, $270; six A B brake test racks, $6189; two Ingersoll-Rand size E 10,000-lb. capacity pneumatic direct lift hoists with top hook, $1451; make and install one car wheel journal truing machine, $486, and one 200-amp. generator set, $658.

Modernistic Factory for a Modern Product

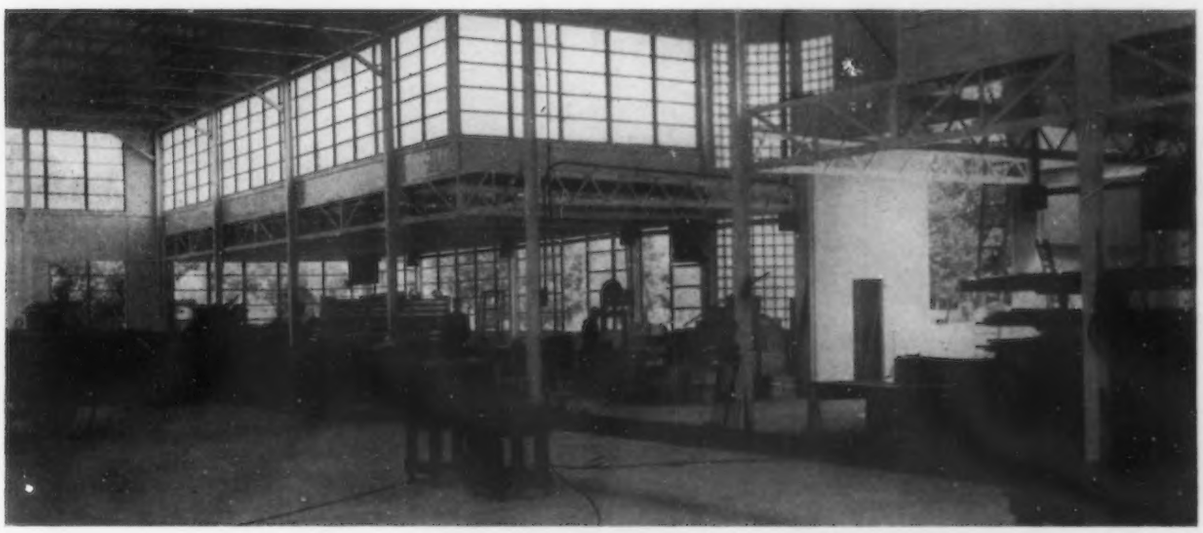
(CONTINUED FROM PAGE 43)

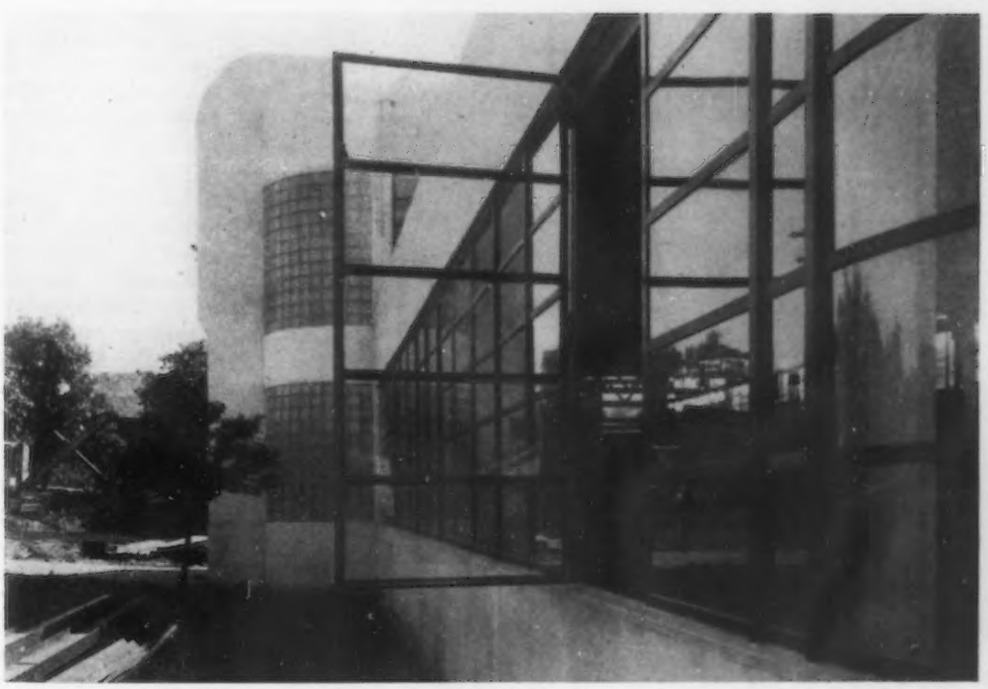
tions of steel houses in the central portion of the building. To obtain the strength necessary to lifting heavy loads, conventional type trusses were used overhead, continuously welded at all joints to obtain maximum strength.

The interior of the building was finished in glass white enamel, and this coupled with maximum light entrance from a large window area causes remarkably good natural lighting conditions for manufacturing operations and pleasant working conditions.

The treatment of the exterior is modernistic. The finish is now white with seafoam green window trim. All corners are round, and all pylons and other trim are curved, causing a very unusual effect and one very pleasing to the eye. At one end of the building are conventional type doors for entrance of raw material. At the other end are airplane hangar type doors to permit the removal of a completed house. About midway is a dormed, modernistic entrance for employees.

The houses built in this factory are complete in ever detail, completely decorated and painted, ready to be placed on a foundation. All that needs to be done is connect light, gas, water and sewer services, and the house is ready to live in.





ABOVE

A WELL-LIGHTED interior affords comfortable working quarters.

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AT LEFT

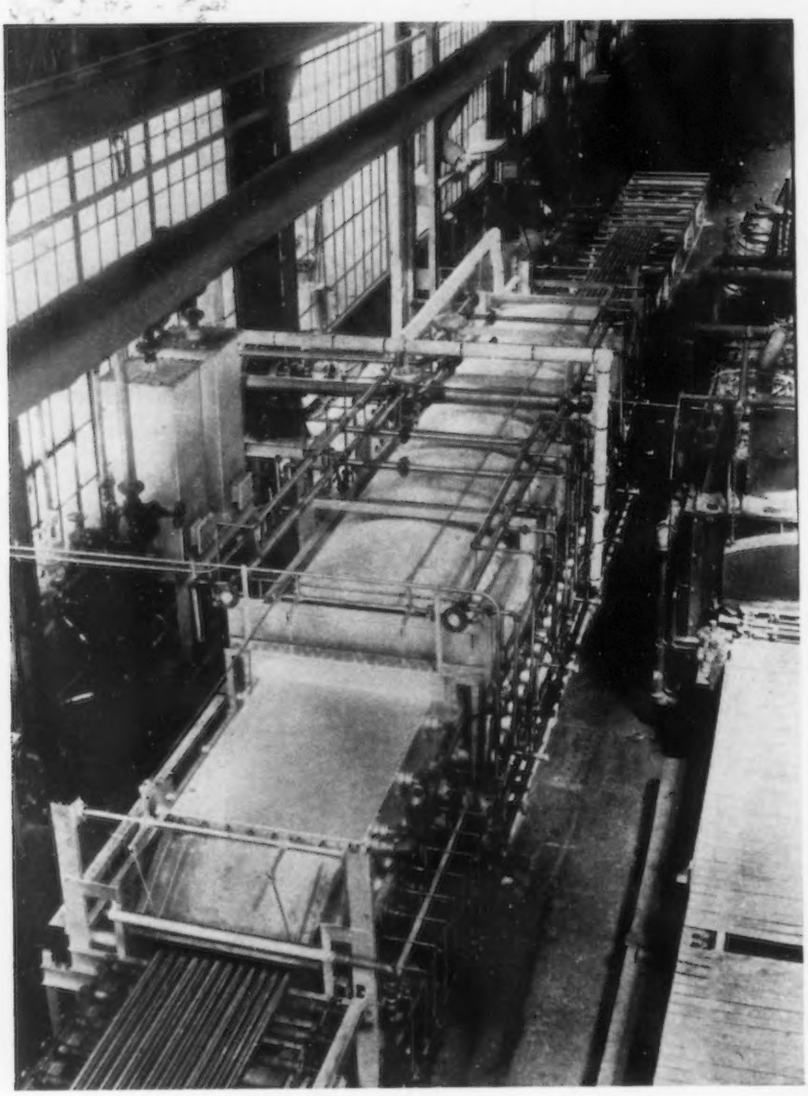
THE window arrangement gives the effect of continuous glass sections all around the building.

Open-Fired Bright Annealing Furnaces For Copper

(CONTINUED FROM PAGE 59)

per was developed after many muffle type bright annealing furnaces had been in operation for the same class of work. The atmosphere balance in the open-fired furnace is somewhat more complicated because the volume of the gases within the furnace chamber varies with the heat demand. When all burners are in the wide open position, sufficient products of combustion are usually produced to stop any air infiltration. On the other hand, the minimum fuel requirement might result in an insufficient volume of products of combustion. By using air-free steam or an extraneous combustion chamber as the make-up atmosphere, the furnace can be properly filled with ample bright annealing gases at all times.

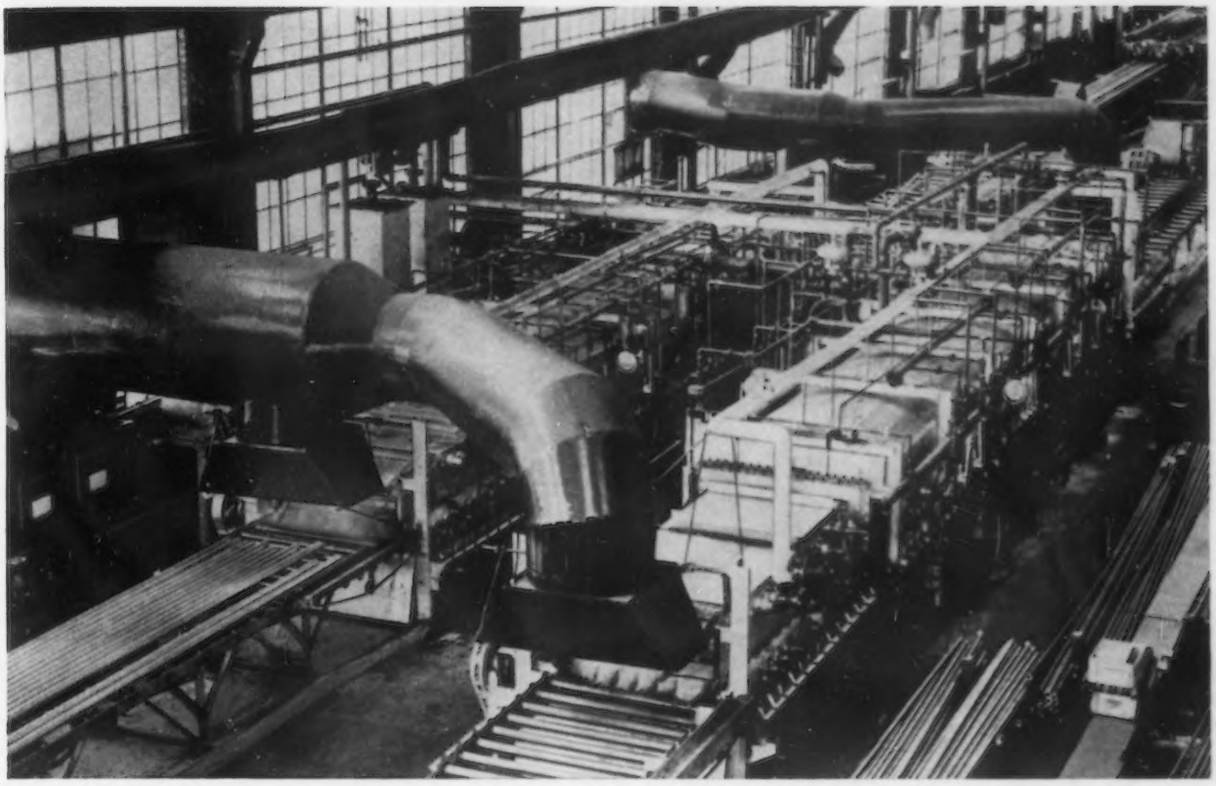
A flue gas atmosphere saturated with water vapor can obviously be applied as long as every portion of the heating and cooling chamber and the work itself are at a temperature exceeding 212 deg. F. Below this temperature, the water vapor will condense, resulting in water stains on the work. If the work is to be slowly cooled in a long cooling chamber, this zone of the furnace will have to be filled with a gas of a sufficiently low dew point to eliminate any condensate. Fortunately, copper can be rendered equally soft whether the annealing at the elevated temperatures is followed by a slow cooling or by a rapid water quench. By resorting to the quenching of the copper as it leaves the heating chamber and before it enters the air, the overall length of the furnace can be greatly reduced which, needless to say, materially lowers the first cost of the installation as well as cuts the floor space requirements to a minimum.



BIRD'S eye view of furnace for bright annealing copper tubes.

These basic ideas have been incorporated in the design of an open-fired annealing furnace which has been built by the Surface Combustion Corp. and at the present time has been in continuous operation in the tube mill of the Mueller Brass Co. in Port Huron, Michigan, for 13 months. It is being used for process annealing and for finish annealing of copper tubes in straight lengths and of copper tubing in coils having a maximum diameter of 36 in. by 10 in. high. Its rated capacity is 6100 lb. per hour, but due to increased production demands, peak loads of 9500 lb. per hour are frequently process annealed with satisfactory results. For finish annealing, the production through the furnace is lowered to about 3500 lb. per hour to insure the more exacting grain sizes of the finish annealed tubing.

These high rates of heating are obtained by over and under-firing the work. The firing equipment consists of a series of standard SC low pressure tunnel type burners which are arranged in groups so as to facilitate the use of any number of burners depending on the rate of production and on the type of anneal desired. Each burner is equipped with a premix pilot flame which is used for easy lighting as well as during continuous operation. The air-gas mixture to these pilots is adjusted, of course, to give the same flue gas analysis as the main heating burners. Once the pilot lights are lit, the special adapter castings for the main burner and pilot burner are sealed air tight by a simple arrangement so that any further lighting or shutting off of the main burners is done without any danger of air intrusion. The proportioning inspirators to



TWO purification towers in the raw gas line reduce the sulphur content.

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each burner group are set to give a flue gas analysis containing about one per cent CO and due to the constancy of the proportioning characteristics of the SC low pressure equipment, the same flue gas analysis is maintained for any rate of firing which is automatically controlled by two control valves, one in the heating zone and the other in the soaking zone of the furnace. In addition to the two control thermocouples which are connected to two Bristol recording control instruments, two other thermocouples are placed in the furnace and are used periodically to check the temperatures in every portion of the heating chamber.

The furnace is fired with carbureted water gas having a heating value of 530 B.t.u. per cu. ft. In order to reduce the sulphur content of the gas, two purification towers are installed in the raw gas line leading to the furnace. These towers had to be repacked only once during the first year of continuous operation and with the proper adjustment of the burners have at all times insured work free from any sulphur stains.

The work is conveyed through the furnace by means of chain driven rollers whereas the charge and discharge tables consist of idler rollers mounted in roller bearings on the structural steel supporting frames. Leaving the heating zone, the work enters the fast cooling chamber provided with a number of water spray pipes which spray quench the hot work from top and bottom and thus reduce the temperature of the work sufficiently low to keep it from tarnishing as it is discharged into the air. The cooling water collects in the tapered bottom of the cooling chamber and flows through a water seal into a large water pit from where it is pumped back into the spray pipes. The use of this closed recirculating system makes it possible to readily regulate the temperature of the cooling water, for it had been found that by properly controlling the temperature of the hot cooling water, the water adhering to the surface of the work is evaporated, as the work enters the room atmosphere and few water stains are then found on the surface of the copper. In addition to also minimizing the cooling water requirements, the closed recirculating system offers the advantage that the water can be conditioned with a suitable soluble oil which covers the surface of the work with a thin oil film thus protecting it against any oxidation during storing or shipping. In this manner a clean surface is not only produced in the furnace but also maintained after the work leaves the furnace.

As mentioned above, particular attention had to be paid to the correct balance of the gas atmosphere within the furnace. For this purpose, the charge and discharge ends of the furnace are provided with hand-operated lift-type doors tightly fitted to the furnace casing and equipped with asbestos curtains. These doors are raised or lowered depending on the height of the work passing through the furnace and reduce the actual work opening to a minimum. As long as all burners are operating at their maximum capacity, they produce a sufficiently large quantity of products of combustion to stop any air infiltration. As this is not the case, however, with the burners on low setting, the defi-

ciency of atmosphere gas volume is made up by the introduction of air-free steam which in this installation is exhaust steam from the power plant. The largest portion of the steam is introduced in such a manner so as not to affect the heating capacity and the efficiency of the furnace. A sufficiently high static pressure is thus maintained in the furnace for all operating conditions to automatically purge the inside of the straight lengths of tubes as they enter and leave the furnace. The coils, however, are purged with raw city gas prior to charging them into the furnace.

The operation of this furnace has been very successful and has confirmed the many advantages which were expected of this type of annealing furnace. It has the same high thermal efficiency as any correctly designed open-fired furnace. When operating the furnace at a continuous rate of 7500 lb. per hour, the fuel requirements are 1280 cu. ft. of 530 B.t.u. gas per ton of copper so that with a gas rate of 45c. per 1000 cu. ft., the fuel cost per ton is 57.5c. Since the annealed tubing is free from oxidation, no pickling is required, and after three months of continuous production, the plant management felt safe in removing the pickling tanks and, in so doing, eliminated an average yearly pickling cost of $1.22 per ton of copper and at the same time gained valuable floor space in the tube mill. The dependability of the furnace was proven by the fact that for 9 months it handled the entire production of the tube mill.

September Tin 2008 Tons Over August

WORLD production of tin in September totaled 19,143 tons, or 2008 tons above the previous month's figure, according to the International Tin Research and Development Council. World consumption for the year ended Sept. 30 amounted to 177,443 tons, as compared with 159,669 tons in the year ended Sept. 30, 1936. Production totals for the same periods were 197,000 tons and 173,400 tons respectively.

Tin plate production in the 12-month period ended Sept. 30 was 4,090,000 tons, as against 3,581,000 tons in the year ended Sept. 30, 1936. Consumption in the United States during the periods covered by the reports increased 17.7 per cent, while the United Kingdom used 12.1 per cent more tin, and Russia 35.5 per cent more.

Electrode For Small A. C. Welders

A MILD steel electrode designed particularly for use with small alternating current transformer-type arc welders has been added to the electrode line of the Lincoln Electric Co., Cleveland.

This new "Transweld" electrode has a very heavy extruded coating and, because of its stable arc, it permits making welds in smooth well-shaped beads. Another advantage claimed is that slag is easily removed from the weld deposits. Weld metal produced has a tensile strength of 75,000 to 85,000 lb. per sq. in., yield point of 60,000 to 68,000 lb. per sq. in., and a ductility of 20 to 30 per cent elongation in 2 in. The electrode is suitable for making all types of welds in flat, horizontal, vertical or overhead position and is said to operate well with direct current of either straight or reversed polarity. Three sizes, namely, 3/32, 1/8 and 5/32 in. are made.

Pittsburgh Tool-Knife Moves Into New Plant

PITTSBURGH TOOL-KNIFE & MFG. CO., Pittsburgh, which was recently incorporated, has moved into a newly equipped plant at Sycamore Street, Etna, Pittsburgh. The company, headed by J. A. Carothers, manufactures metal cutting saws, rivet sets, chisel blanks, paper knives, small shear blades and hardened steel specialties.

Bethlehem Office Workers Go on a Shorter Week

OFFICE employees of the Bethlehem Steel Co. were placed on a share-the-work schedule Dec. 1, with the elimination of Saturday work wherever the present reduced rate of operations permits. Plant wage earners have already been placed on a reduced work week due to the decline in steel operations.

Expansion Planned for Jap Machine Tool Plants

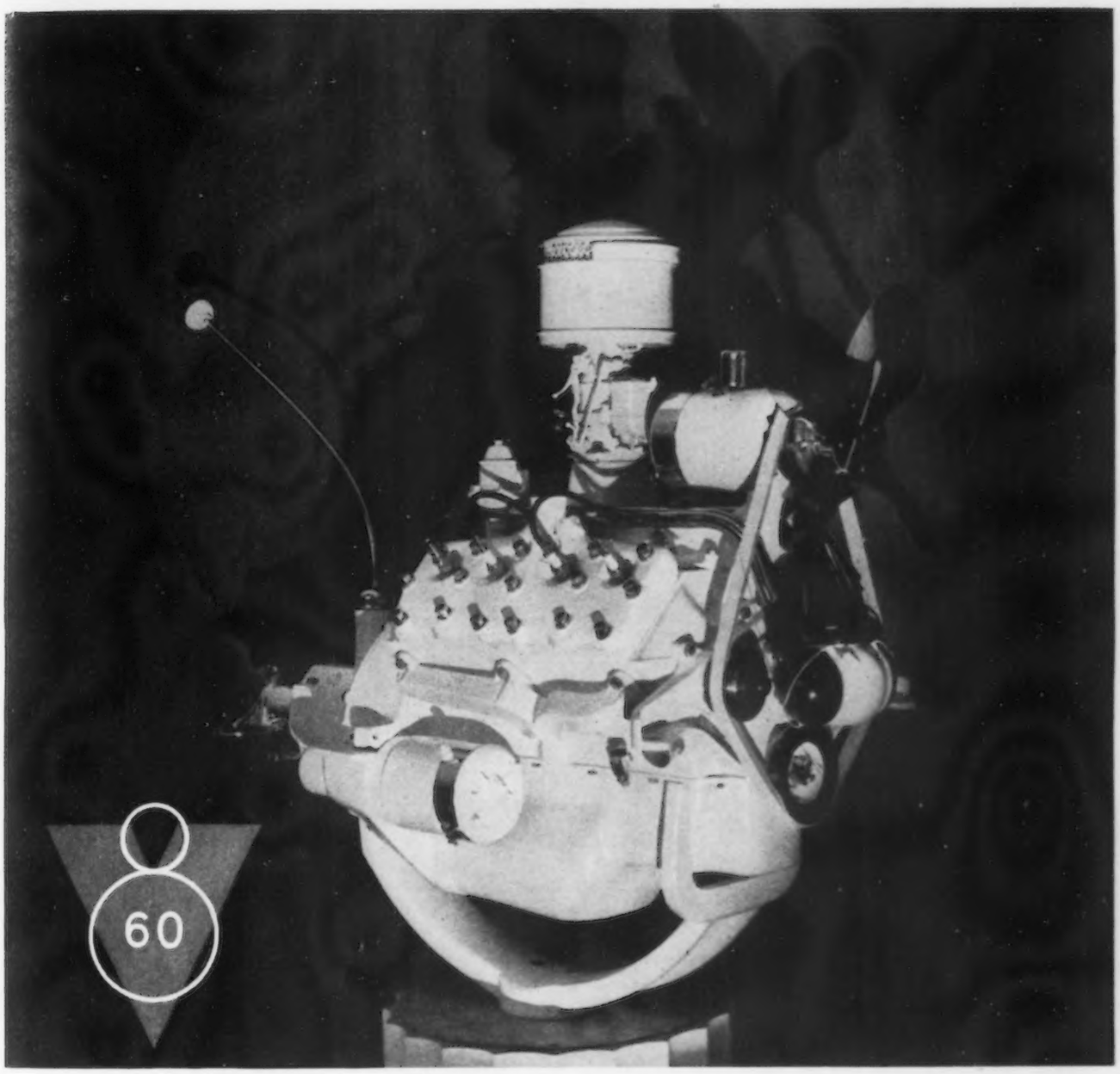
OKUMA TEKKOSHO, one of the five big Japanese machine tool companies, will carry out its second expansion program and start within this year the operation of a new shop and auxiliary buildings. A part of the new capital of 2,000,000 yen added to the previous 2,000,000 yen has been paid to finance the project, according to the U. S. Bureau of Foreign & Domestic Commerce in *World Machinery News* for October-November.

Another company, Niigata Tekkosha, plans to make in its own shops the machine tools needed for extension of Niigata machine tool and machinery manufacturing plants, but it must buy from America by next spring almost all machine tools required for expanding the Kamata engine factory.

For some time the Finance Ministry has been licensing one application after another for machine tool imports, whereas during August nothing but munitions machinery was allowed entry. Other kinds of machines will also be licensed because the Finance Ministry's policy now is to permit establishment of new enterprises and expansion of existing facilities in the field of machine tool, small tool, chemical plant and mining machinery in accordance with the emergency capital adjustment law passed during the recent Diet session.

Steel Joist Size Schedules Affirmed

THE Bureau of Standards at Washington has announced that a simplified schedule of sizes for open-web steel joists ranging from 8 to 16 in. with specified properties and allowable loads in pounds per linear foot has again been reaffirmed without change by the standing committee of the industry. Copies of the recommendation may be obtained from the Superintendent of Documents, Government Printing Office, Washington, for 5c.



PUBLIC ECONOMY No. 1

V-type eight-cylinder engines were put in Ford cars over a chorus of "can'ts" and "never will bes." For years eight-cylinder cars were mentioned in the same breath with mink coats and big bank balances.

It took the unequaled experience and tremendous manufacturing facilities of the Ford Motor Company to bring the V-8 engine to the low-price field.

For years it was said that eight-cylinder engines cost more to run. Henry Ford believed that design—and not the number of cylinders—determined the cost of running an engine. Laboratory and road tests proved to his satisfaction that he was right. Ford facilities and experience kept production costs down—and the Ford V-8 was introduced to the world.

The records of oil and gasoline economy turned in from then on by Ford owners over millions of road miles proved conclusively that added cylinders had little to do with operating costs. Thus, the Ford V-8 engine proved its ability to meet the rigid economy requirements of the low-price field.

If any lingering doubt existed, the Ford V-8 "60," introduced a year ago, swept it aside and proved beyond question that V-8 engines can be built to operate with rock-bottom economy.

Instinctively the world of thrifty motorists responded to the announcement of a smaller Ford V-8 engine—and it was right! Letters began to pour in with records of 22 to 27 miles to the gallon—and even more!

In the first year of its career more than 300,000 motorists adopted the 60-horsepower Ford V-8. It became, in short, Public Economy No. 1. Today, it is the symbol of economy in fine-car motordom. That is appropriate, since "economy" is—and always has been—a Ford word.

Ford

FORD MOTOR COMPANY

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Texas Co., 135 East Forty-second Street, New York, has approved plans for expansion and improvements in oil refinery at Port Neches, Tex., including several one and multi-story buildings and additional equipment. Steel tank storage division will be increased. Award for new vacuum still unit has been made to Alco Products, Inc., 30 Church St., New York. Entire project will cost close to $1,000,000.

Muskin Mfg. Co., 61 Washington Street, Brooklyn, manufacturer of metal goods, has leased three floors in six-story industrial building at 104 Ashland Place for expansion.

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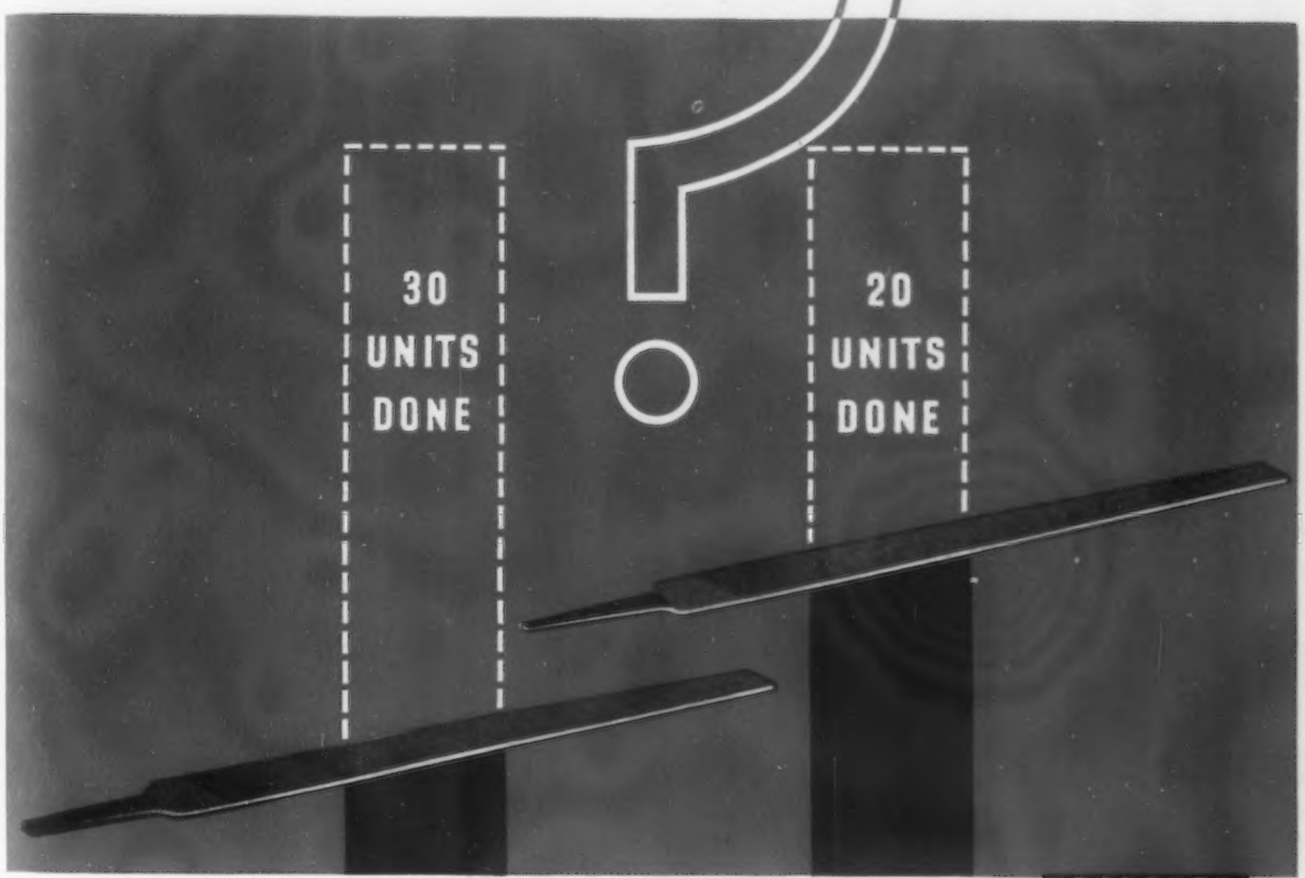

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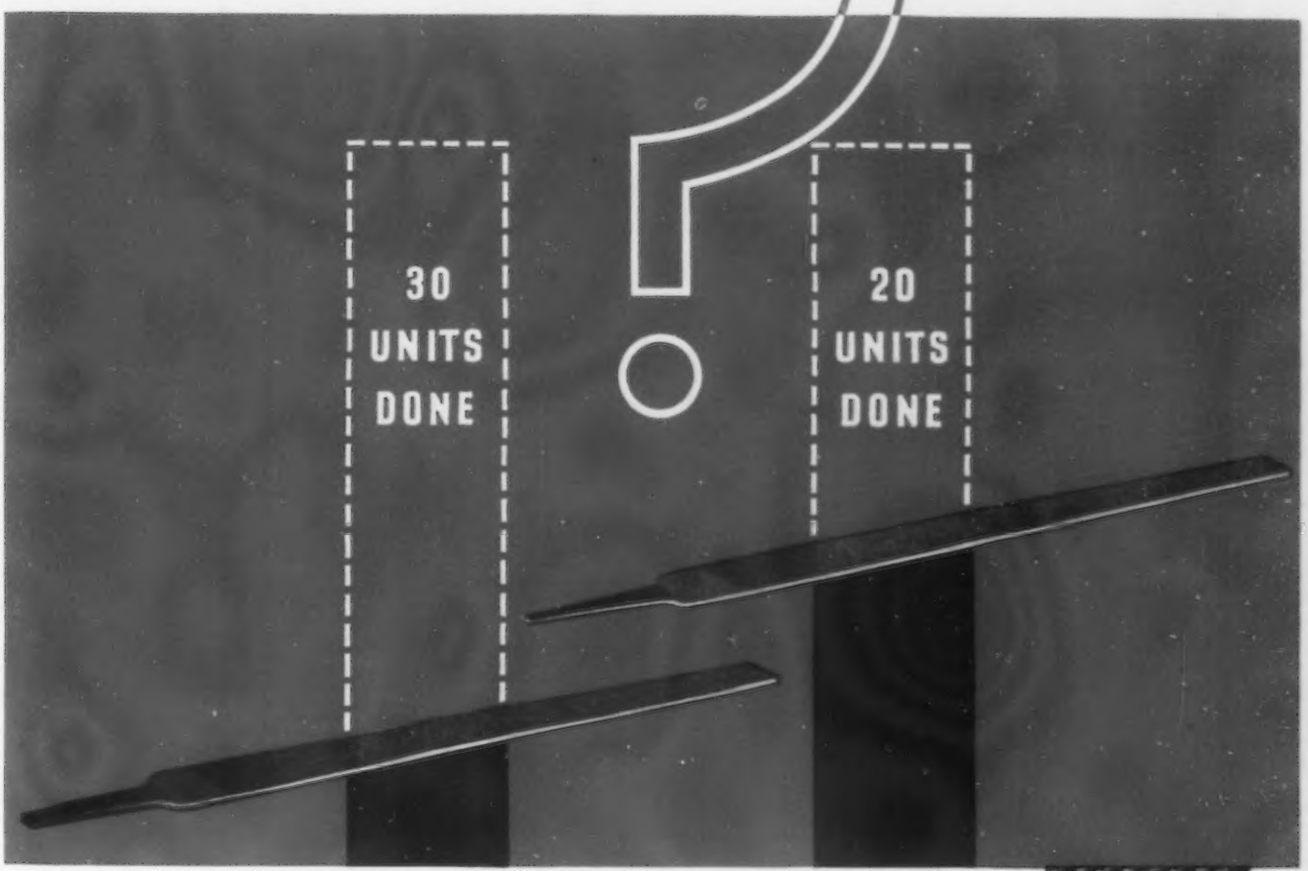

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Swift & Co., Lake Charles, La., meat packer, plans rebuilding main unit at new local plant, now in course of completion, recently damaged by fire. Loss about $50,000. Main offices of company are at Union Stock Yards, Chicago.

SOUTHWEST

Sterling Aluminum Products, Inc., 2914 North Market Street, St. Louis, manufacturer of automobile parts and other metal specialties, has let general contract to Edward J. Lawler, 6635 Delmar Boulevard, architect and builder, for new one and two-story plant, 100 x 160 ft., at 2924 Benton Street. Cost over $50,000 with equipment.

General Steel Products Co., 2002 West Seventh Street, Joplin, Mo., has approved plans for one-story addition, 50 x 100 ft., for storage and distribution, and will proceed with superstructure by day labor. Cost close to $30,000 with equipment.

Magnolia Petroleum Co., Dallas, Tex., plans new carbon black manufacturing plant near Stonewall, Fitts oil field area, Pontotoc County, Okla. It will include large air compressor plant, power house, and storage and distributing buildings. Cost over $250,000 with machinery.

Board of Education, Fulton, Mo., plans manual training department in new two-story and basement senior high school, for which bids have been asked on general contract. Cost about $250,000. Felt & Kriehn, 4638 Mill Creek Parkway, Kansas City, Mo., are architects.

Armour & Co., Union Stock Yards, Chicago, have acquired a 15-acre tract near Buffalo Bayou, Houston, Tex., for new plant, with power house, machine shop and other buildings. In addition to meat packing plant a separate unit will be erected fr a vegetable oil refinery. Work is scheduled to begin early in 1938. Cost close to $1,000,000 with equipment.

Phillips Petroleum Co., Philtower Building, Tulsa, Okla., plans extensions in natural gasoline refinery at Odessa, Tex., including new processing equipment. Cost over $75,000.

Board of Education, Galveston, Tex., plans manual training equipment in new two-story junior high school, 240 x 245 ft., for which bids will close on general contract about Jan. 18. Cost $500,000. Financing has been arranged through Federal aid. Benjamin Milam, 2115 F Street, is architect.

WESTERN PA. DIST.

Pennsylvania Tank Car Co., Oil City, Pa., has purchased about 15 acres formerly occupied by Eclipse refinery of Atlantic Refining Co., and will use part of tract for new one-story tank car repair and service shop. Cost close to $50,000 with equipment.

Gulf Oil Corp., Gulf Building, Pittsburgh, will make extensions and improvements in oil refinery at Port Arthur, Tex., including new units for gasoline refining department and other divisions. Steel tank storage and distributing facilities also will be increased. Cost close to $1,000,000 with equipment.

United States Engineer Office, New Post Office Building, Pittsburgh, asks bids until Dec. 17 for construction of dam and appurtenant structures on Crooked Creek, near Ford City, Pa., to include 95,000 lb. of metal work, 13,000 lb. of wrought iron pipe, 50,000 lb. black steel pipe, and 150,000 lb. of cast iron pipe (Circular 165).

OHIO AND INDIANA

Schill Mfg. Co., Crestline, Ohio, manufacturer of domestic furnaces, parts, etc., plans one-story plant addition. Cost close to $40,000 with equipment.

Superior Switch Board and Devices Co., Canton, Ohio, has let general contract to Warren Hoffman Co., 312 Third Street, N. W., for one-story addition. Cost about $50,000 with equipment.

Owens-Illinois Glass Co., Ohio Building, Toledo, Ohio, plans new branch plant at San Francisco, to be operated by Owens-Illinois Pacific Coast Co., 1855 Folsom Street, San Francisco. Cost over $100,000 with machinery.

Dayton Rubber Mfg. Co., West Riverview Avenue, Dayton, Ohio, manufacturer of automobile tires and other rubber goods, plans one-story mill addition. Cost over $50,000 with equipment. Geyer & Neuffer, Ludlow Arcade Building, are architects. A. C. Sigmon is company engineer at plant.

Atlantic Refining Co., 260 South Broad Street, Philadelphia, will take bids soon on general contract for new bulk oil storage and distributing plant on Eggers Avenue, Cleveland. Cost over $50,000 with steel storage tanks and other equipment.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until Dec. 13 for chrome molybdenum seamless steel tubing and chrome nickel corrosion-resistant seamless steel tubing (Circular 459), traffic control lamp assemblies and sets of spare parts (Circular 458); until Dec. 16, 10 electric furnaces, four electric ovens and one natural gas-fired oven (Circular 438).

Board of School Trustees, Evansville, Ind., has authorized plans for new two-story vocational school, for which bids will be asked on general contract early in 1938. Cost about $250,000 with equipment. Fowler & Legeman, Central Union Building, are architects. R. A. Putnam is business manager of board.

John Deere Plow Co., Moline, Ill., and 216 South Senate Street, Indianapolis, has let general contract to Service Construction Co., Castle Hall Building, Indianapolis, for one and two-story factory branch, storage and distributing plant on West Washington Street, Indianapolis, approximating 100,000 sq. ft. floor space. Cost about $200,000 with equipment.

MICHIGAN DISTRICT

Bay Refining Corp., 205 Bearinger Building, Saginaw, Mich., recently formed with capital of $250,000, has secured site at mouth of Saginaw River, Bay City, Mich., for new oil refinery and will begin work at once. It will include power house, pumping station and steel tank storage and distributing facilities. Cost over $150,000 with equipment. Gordon Oil Co., Mount Pleasant, Mich., is interested in new organization.

Continental Motors Corp., 12801 East Jefferson Avenue, Detroit, manufacturer of automobile and airplane motors, and parts, plans one-story addition, 50 x 200 ft., for a testing division for airplane motors. Cost close to $50,000 with equipment.

Bennett Pumps Co., Muskegon, Mich., manufacturer of gasoline pumps and parts, has let general contract to Arthur O. Olsen Co., Muskegon, for one-story addition for storage and distribution. Cost about $40,000 with equipment. Company is affiliated with Service Station Equipment Co., Conshohocken, Pa.

Board of Education, Iron Mountain, Mich., plans installation of manual training equipment in new two-story junior high school, for which bids have been asked on general contract. Cost about $200,000. F. E. Parmelee, Iron Mountain, is architect.

Detroit Gasket & Mfg. Co., 12640 Burt Road, Detroit, plans one-story addition. Cost close to $40,000 with equipment. H. D. Ingenfritz, 468 Prentiss Street, is architect.

MIDDLE WEST

Sucony Paint Products Co., 59 East Van Buren Street, Chicago, manufacturer of paints, varnishes, oils, etc., has asked bids on general contract for four-story and basement addition to plant in Clearing Industrial District. Cost close to $100,000 with equipment.

Signode Steel Strapping Co., 2600 North Western Avenue, Chicago, has let general contract to Ropp Construction Co. 3335 North Kedzie Avenue, for one-story addition, and alterations and improvements in present plant. Cost about $45,000 with equipment. Allen & Webster, 225 North Michigan Avenue, are architects.

Universal Oil Refineries, Inc., Amarillo, Tex., has acquired tract at Pueblo, Colo., for new oil refinery, for which work will begin soon. It will include power house, pumping station, and steel tank storage facilities. Cost close to $100,000 with machinery.

City Council, Fairbury, Neb., asks bids until Dec. 20 for extensions and improvements in municipal light and power plant, including 2500-kva. steam turbo-generator unit, with condenser and auxiliary equipment, and alternate bids for a 3000-kva. steam turbo-generator unit; also for a watertube boiler, with superheater, air preheater and accessories, and for two boiler-feed pumps and miscellaneous equipment. Cost about $95,000.

United States Engineer Office, Fort Peck, Mont., asks bids until Dec. 13 for grease guns, drills for blacksmith drill press, twist drills, valves, alemite fittings, etc. (Circular 165).

City Council, Sleepy Eye, Minn., asks bids until Dec. 16 for addition to municipal electric power plant, including new diesel engine-generating unit and auxiliary equipment. G. M. Orr & Co., Baker Arcade Building, Minneapolis, Minn., are consulting engineers.

H. Graver Co., 3940 South Normal Avenue, Chicago, meat packer, has acquired a two-story industrial building at Morgan and West Thirty-eighth Street, 150 x 182 ft., and will remodel for new plant. A one-story addition will be built. Cost over $50,000 with equipment.

PACIFIC COAST

Procter & Gamble Co., West Seventh Street, Long Beach, Cal., has let general contract to Ford J. Twaits Co., 816 West Fifth Street, Los Angeles, for two six-story additions for expansion in oil-processing and other divisions. Cost about $1,000,000 with machinery. J. H. Davies, Ocean Center Building, Long Beach, is engineer. Main offices of company are at Cincinnati.

New Century Beverage Co., 3521 Chestnut Street, Oakland, Cal., has plans for one-story building at 3526-34 Adeline Street for storage and distribution. Cost about $30,000 with equipment. Erection will be carried out by day labor.

Metropolitan Water District, 306 West Third Street, Los Angeles, asks bids until Dec. 14 for 10 electric motor starters for circulating water pumps at Colorado River Aqueduct pumping stations (Specifications 257).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Dec. 14 for one motor-driven combination shear, punch, coper and notcher (Schedule 2223), six gasoline engine-operated industrial shop trucks (Schedule 2260), one 15-ton low bed heavy-duty trailer, full trailer type (Schedule 2259); until Dec. 17, one motor-driven, single-spindle sensitive drill (Schedule 2249), one motor-driven power squaring shears (Schedule 2252), one motor-driven, heavy-duty pedestal grinder (Schedule 2254), one hand-operated turret punch (Schedule 2250), one motor-driven, horizontal boring, drilling and milling machine (Schedule 2251), one x-ray developing tank (Schedule 2265) for San Diego Naval Air Station; six motor-driven light-duty engine lathes (Schedule 2232), one 36-in. band saw, motor-driven (Schedule 2248), one motor-driven radial drilling machine (Schedule 2246), one motor-driven pedestal-type grinder (Schedule 2247) for San Pedro, Los Angeles, Naval Station; until Dec. 14, one motor-driven press brake and one set of dies (Schedule 2210); until Dec. 17, six motor-driven, ram-type turret lathes (Schedule 2077) for Puget Sound Navy Yard.

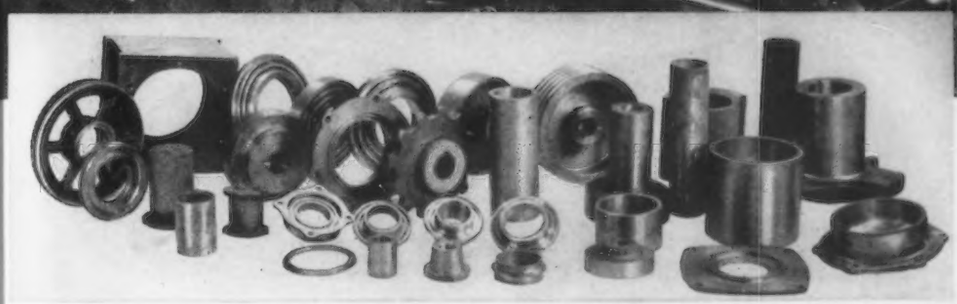
International Harvester Co., 916 Maynard Avenue South, Seattle, has leased one-story industrial building, 188 x 266 ft., to be erected by Union Pacific Railroad, Seattle, at First Avenue South and Dawson Street, for new factory branch, storage and distributing plant. Bids will be asked at once on general contract. Cost close to $100,000 with equipment. Samuel Murray, Pittock Block, Portland, is construction engineer of western district for railroad company, in charge.

FOREIGN

Commonwealth Oil Refineries, Ltd., Melbourne, Victoria, Australia, has acquired large tract at Port Kembla, near mill of Australian Iron & Steel, Ltd., for new oil-blending plant, for blending refined oils with benzol, the latter to be secured from coke plant of Australian company noted. A power house will be built, with steel tank storage and distributing facilities. Cost over $500,000 with machinery.

Singer Sewing Machine Co., Ltd., Sao Paulo, Brazil, plans rebuilding part of plant recently destroyed by fire. Loss over $250,000 with machinery. Company is a foreign subsidiary of Singer Sewing Machine Co., 149 Broadway, New York.

Imperial Oil, Ltd., 56 Church Street, Toronto, Ont., plans expansion and improvements in oil refinery at Calgary, Alta., including new buildings and installation of cracking equipment and other machinery. Cost about $500,000 with equipment. Company also will carry out a similar program at oil refinery at Regina, Sask., to cost close to $350,000 with machinery.



In machining 41 different parts in small lots, this modern Gisholt Turret Lathe saves more than $300 per week as compared with former production cost. On the bearing spacers and oil seals pictured above, machining cost was cut from $10.23 to $1.99 each.

GISHOLT TURRET LATHES

Sizes range from 1″ to 12″ bar capacity—up to 34″ chucking capacity

● You can make substantial cost reductions on small lot work as well as on large quantities when you're properly equipped with modern Gisholt Turret Lathes. For example, this manufacturer's cost records showed that this Gisholt 2L High Production Turret Lathe saved over $2000 in seven weeks—paying for itself in 6 months—a record all the more impressive because it was made on small lot work.

Such tremendous savings are made possible by these features, found only in Gisholt High Production Turret Lathes:

★ Power rapid traverse to the tool-post carriage in both directions, cross and longitudinal—quickly brings cutting tools into position.

★ Power rapid traverse longitudinally to the hexagon turret saves physical effort and speeds up production.

★ Automatic spindle brake saves time, stops the spindle quickly when reloading the chuck.

★ Heavy, rigid construction with hardened steel ways insures accurate work and long tool life and permits use of modern, faster cutting tools and higher cutting speeds.

★ The use of Gisholt standard tools makes setup quicker and easier.

★ Micrometer dial, mounted on hexagonal turret, facilitates fast setting and quick machining to close limits.

Write us today for complete information on these new Gisholts

GET YOUR COPY OF THIS GISHOLT SMALL TOOL CATALOG

Therein, you'll find many new ways to cut your machining costs with tools which reduce chatter and vibration, save setup time, do two or more operations at once, permit faster cutting speeds.

These standard tools are for use on other machines as well as Gisholts. Write for your copy of this new catalog.

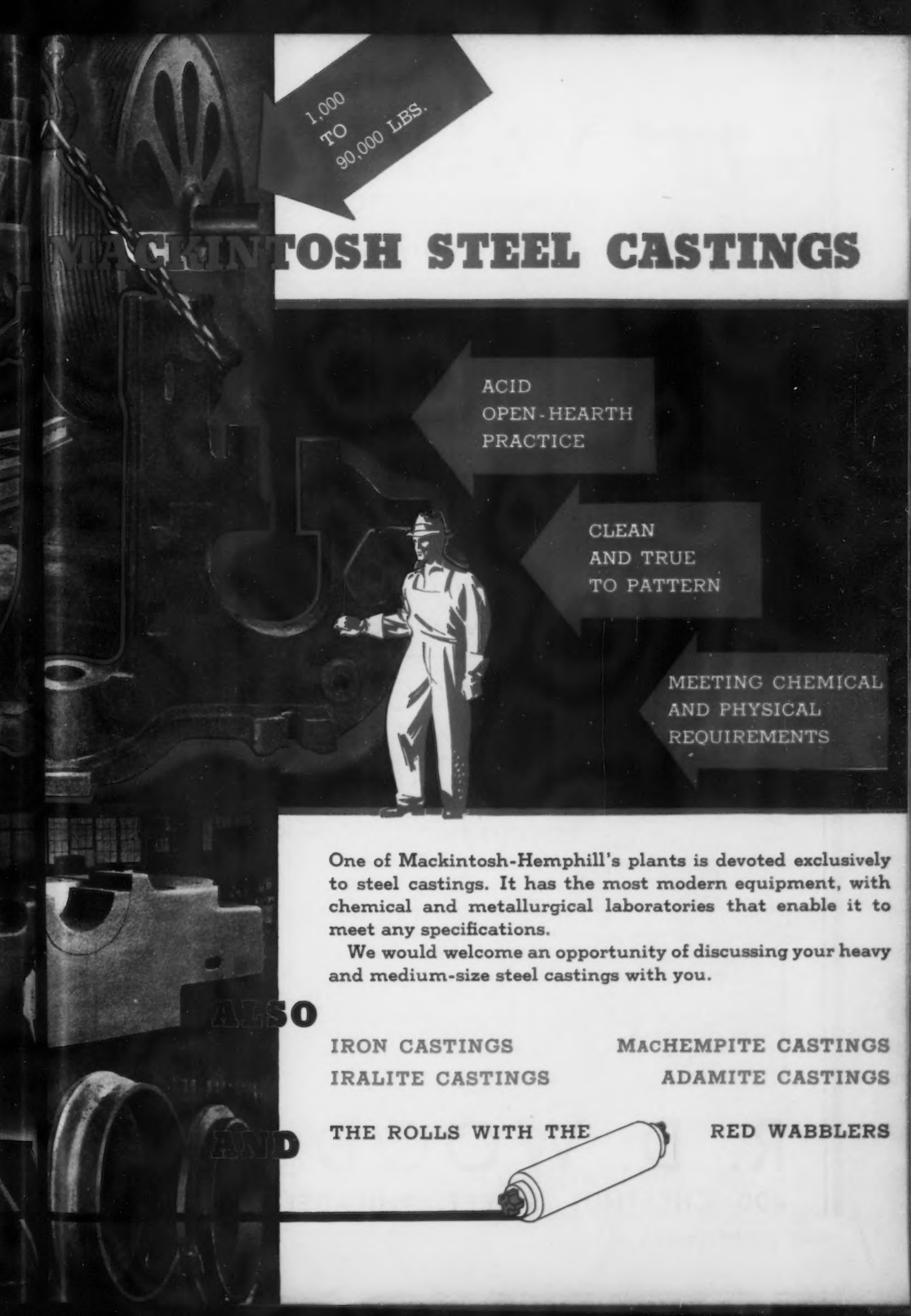
GISHOLT

GISHOLT MACHINE COMPANY

1215 EAST WASHINGTON AVENUE, MADISON, WISCONSIN, U. S. A.

TURRET LATHES • AUTOMATIC LATHES • TOOL GRINDERS • BALANCING MACHINES

MACKINTOSH-HEMPHILL COMPANY, PITTSBURGH AND MIDLAND, PA.



One of Mackintosh-Hemphill's plants is devoted exclusively to steel castings. It has the most modern equipment, with chemical and metallurgical laboratories that enable it to meet any specifications.

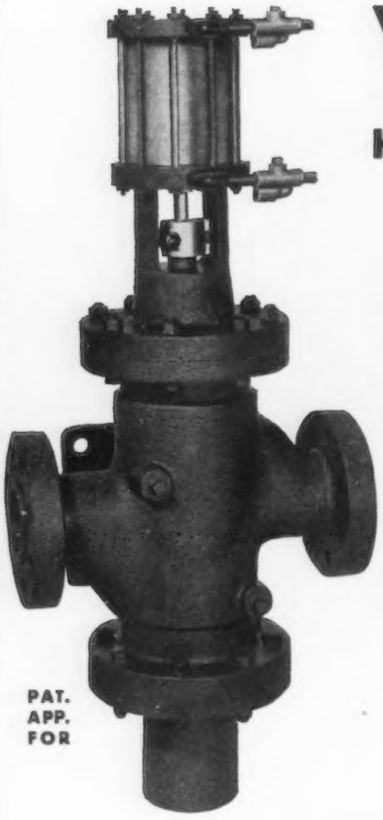
We would welcome an opportunity of discussing your heavy and medium-size steel castings with you.

ALSO

IRON CASTINGS — **MACHEMPITE CASTINGS**

IRALITE CASTINGS — **ADAMITE CASTINGS**

AND THE ROLLS WITH THE RED WABBLERS



PAT. APP. FOR

VALVES

MADE SPECIFICALLY FOR

HYDRAULIC DESCALING SYSTEMS

SPRAY CONTROL VALVE

PROGRESS demands constant improvement. The R. D. Wood Co. hydraulic shut-off valve for spray nozzle control, centrifugal pump bleeding, by-passing, and other similar uses is just another example of PROGRESS, in which R. D. WOOD CO. has been a leader, almost since the beginning of the hydraulic industry.

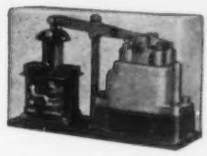
The latest developments in design, manufacture, and metals combine to make this valve THE OUTSTANDING SPRAY VALVE on the market. It has all the good points found in valves of other makes plus

10 SUPERIOR FEATURES.

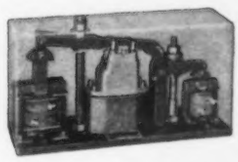
HAND OPERATED	SCREWED
REMOTE CONTROL	FLANGED
AUTOMATIC OPERATION	SIZES TO 8"

PRESSURES TO 2000 lbs.

No. 1 Control. Hand operated Pilot



No. 2 Control. Single Solinoid Pilot.



No. 3 Control. Momentarily Energized Double Solinoid Pilot.

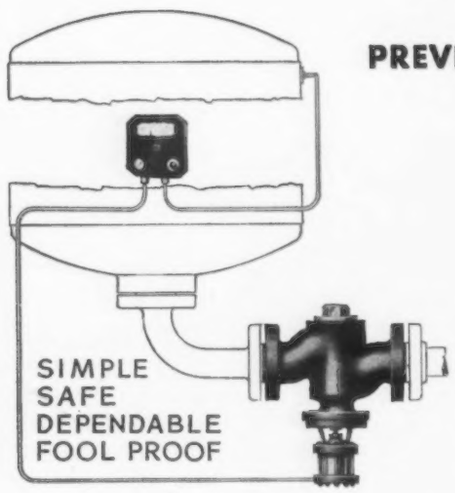
THE ONLY SPRAY VALVE WITH SHOCK CONTROL PORTS

AUTOMATIC ACCUMULATOR

DOUBLE SEALED

SAFETY SHUT-OFF

FOR HYDRO-PNEUMATIC SYSTEMS



PREVENTS SHUTDOWNS from LOSS of AIR:

1. In case of hydraulic line break.
2. In case of leakage.
3. In case of current failure.
4. In case of pump trouble.
5. In case of air failure.
6. In case of excess water demand.

An engineering staff fully competent to design the most complicated and efficient valves and hydraulic machinery for your particular needs, modern shops with latest types of equipment, and skilled workmen most of whom have grown up in the industry, are at your service. Write us for more specific information or concerning any hydraulic problem.

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THE TREND TODAY IS TO GAS

FOR ALL INDUSTRIAL HEATING

Always a dependable and economical source of heat, Gas today enjoys advantages of controllability and flexibility that make it the preferred fuel for all industrial heating operations.

Modern improvements in Gas equipment provide uniform distribution of heat and an automatic accuracy in heat control that goes far beyond anything industry ever has known. Losses due to over-heating or under-heating are reduced to a minimum. Guess work is eliminated. And the exact temperatures required for uniform product quality are assured.

With an up-to-date Gas installation, any desired temperature or furnace atmosphere can be obtained quickly and maintained indefinitely. No heating job is too large or too small for Gas to demonstrate its economy and efficiency. Let your gas company show you how Gas can earn new profits for you.

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NORMALIZING · BLUEING · CARBURIZING · FORGING · GALVANIZING · CORE BAKING
MALLEABLIZING · NITRIDING · And many other industrial processes

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INDUSTRIAL GAS SECTION: 420 LEXINGTON AVE., NEW YORK

...OUTPUT

NEW MACHINES SPECIALLY DESIGNED TO MEET DEMANDS OF CHUCKING WORK

HERE are chucking machines that are not just modified bar types—but machines designed from the ground up with chucking needs in mind.

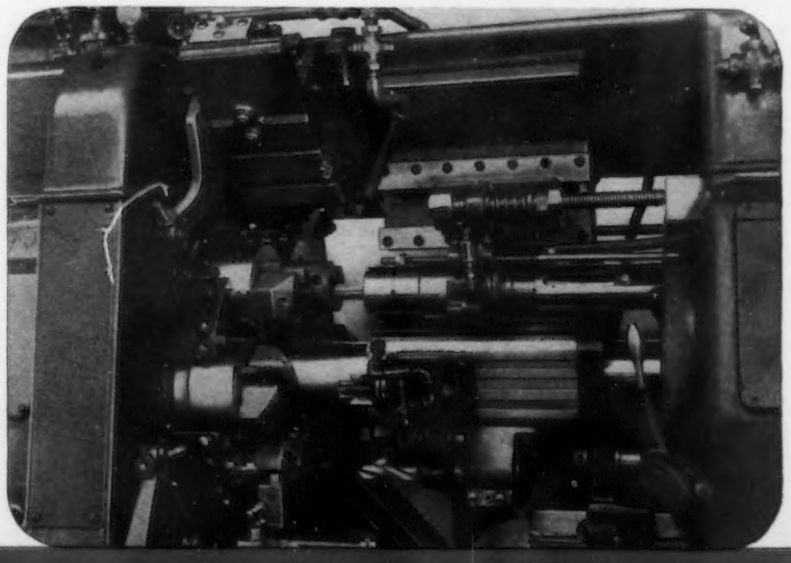
To obtain peak production National Acme engineers have arranged everything for the greatest convenience of the operator—for ease of chucking and simplified control. The handling of the machine is so simplified that operators are quickly able to step up production speeds.

The loading position is about waist high, the bed is recessed so that the operator may stand very close to his work. Safety devices protect him from injury at all times. On Model RU, chucking is controlled by air, on the new Model RPL by electric motor. Model RU is available in 4-spindle 8″ diameter chucks and 6-spindle 6½″ diameter chucks. Model RPL in 4-spindle 8″ or 10″ diameter chucks, 6-spindle 8″ diameter chucks. The machines have 32 spindle speed changes.

All working parts are built with great accuracy and have the sturdiness and power to sail through heavy work. They have many advantages for work in steel forgings and castings, yet have the required speed for production work in brass.

Many manufacturers have made startling increases in output and other big savings with these new machines. Our engineers will survey your equipment and carefully estimate your savings—without obligation.

Just write The National Acme Company, Cleveland, Ohio.



Everything clear for quick tooling, rapid chucking.

Automatic Screw Machines
Dies and Taps
Positive Centrifuges
The Chronolog
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NATIONAL

STEPPED UP

MODEL RPL—*Electric chucking with built-in torque motor. Positive grip—with simplified single lever control.*

CONSTRUCTION FEATURES
BOTH MODELS

Plenty of power for tough jobs.

Anti-friction bearings on all fast-moving parts reduce maintenance expense.

All gears are of alloy steel, heat treated.

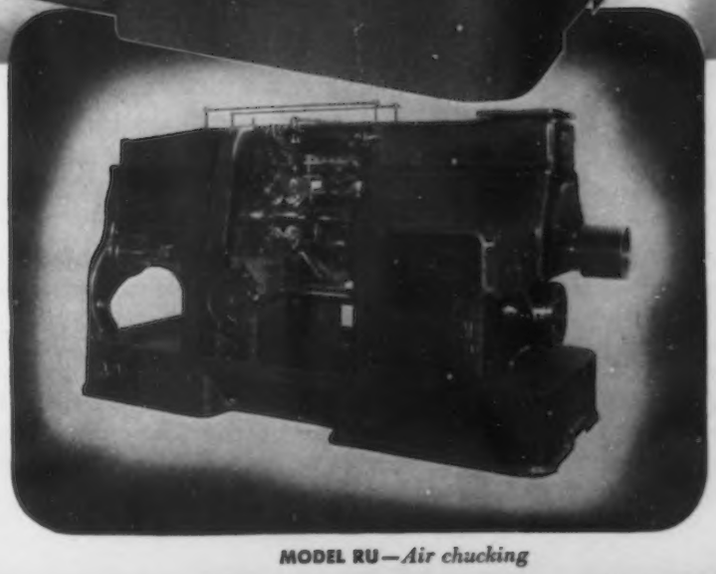
Automatic lubrication pump feeds flood of oil to all necessary parts.

Automatic coolant pump.

Large chip space, emptied from the rear without disturbing operator.

All parts easily accessible to reduce setting-up time.

Extreme versatility in combining many different operations.

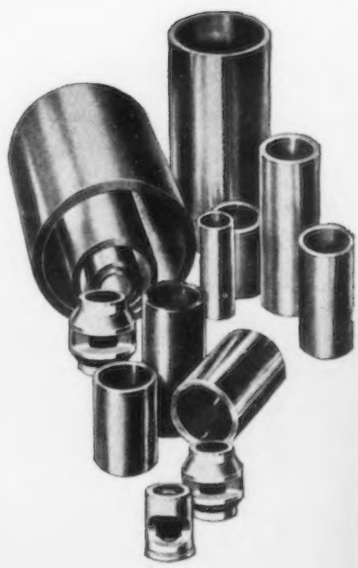


MODEL RU—*Air chucking*

ACME GRIDLEY AUTOMATICS

When you write the specifications of a bearing you commit yourself to certain definite costs—cost of the bearing, cost of installation, cost of replacement. Also, your selection of a bearing often determines the performance of the machine you build. The data on your blue print is as binding as your signature on a contract.

These are reasons why so many manufacturers—among them some of the largest in America—request the counsel and aid of Bunting's engineering and metallurgical staffs when making up bearing specifications. Vast experience, constant research, unremitting study of bearing design, alloy and application prepare this company to render valuable service to your engineering department. This collaboration costs you nothing. It does not in any way obligate you. Let us help you specify the most economical and best bearing for your purpose or check the suitability of bearings you are now using. . . The Bunting Brass & Bronze Company, Toledo, Ohio. . . Branches and Warehouses in All Principal Cities.

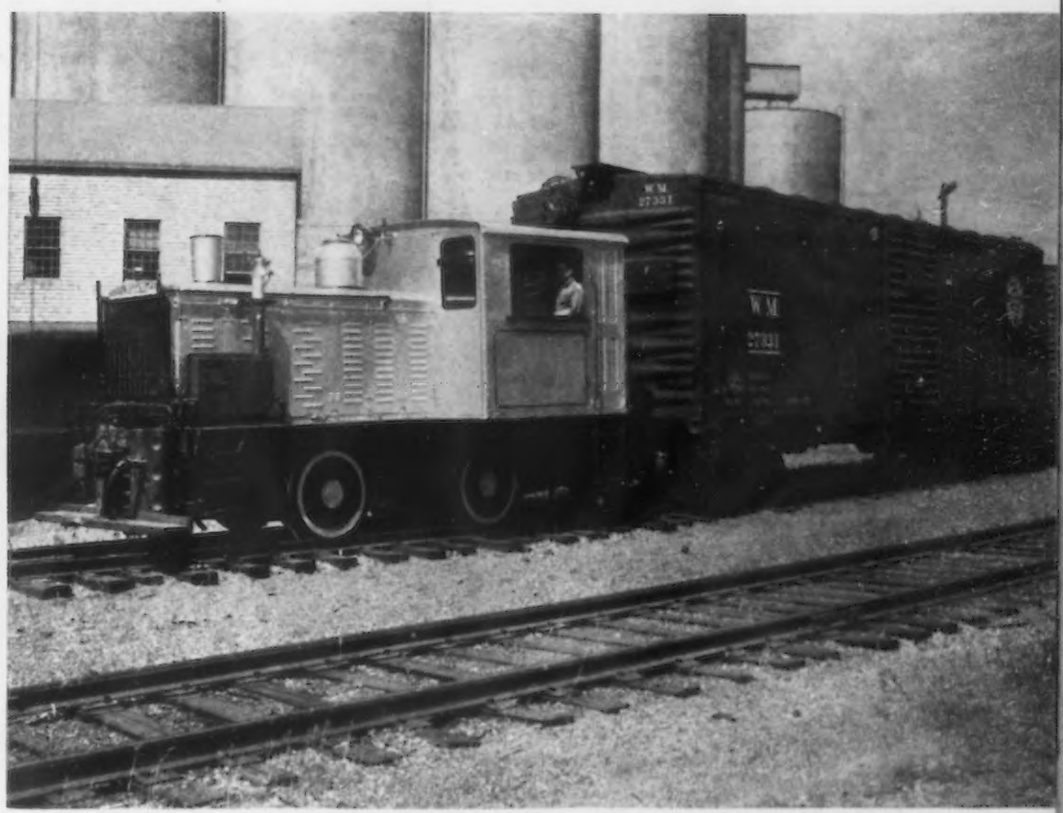


BUNTING Bunting **Quality**

BRONZE BUSHINGS • BEARINGS
MACHINED AND CENTERED BRONZE BARS
BABBITT METALS

103,680 STARTS AND STOPS

What a Transmission!



03,680 Starts and Stops in 90 Days!

otal Fuel and Maintenance 1.81 Per Day!

7 years' average ... all year service

HERE'S THE STORY!

● During the grain storing season the National Milling Company division of the NATIONAL BISCUIT CO. switches 24 hours a day, seven days a week for a period of approximately three months. THE GRAIN MUST MOVE. Eight cars per hour through the car dumper -- six stops and starts for each car movement -- 103,680 starts and stops in 90 days for the sturdy Plymouth Switcher -- and the rest of the year handling the ORDINARY yard switching.

NO FAILURE OF ANY PART OF THE FAMOUS PLYMOUTH TRANSMISSION IN SEVEN YEARS. AND ONLY ONE CLUTCH REPLACEMENT.

Your service probably isn't this tough but here is a vivid picture of what these sturdy little switchers can take. If you want economical haulage, check into Plymouth's Proven Performance!

PLYMOUTH LOCOMOTIVE WORKS

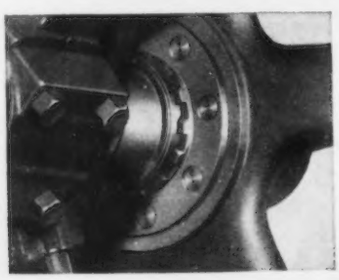
(Division of the Fate-Root-Heath Company) - PLYMOUTH, OHIO

ANT SWITCHING cheaper with PLYMOUTH

GASOLINE • DIESEL • ELECTRIC • BUTANE • PROPANE

LOCOMOTIVES

Here are the facts on why
NIAGARA PRESSES & SHEARS
are in action in America's leading manufacturing plants



Latest type Niagara Presses and Shears are equipped with patented 14-point engagement Sleeve Clutch with built-in single stroke mechanism. Instant engagement eliminates varying time lag and results in more strokes per hour and utmost safety. Write for Bulletin giving complete description on this exclusive Niagara development.

NIAGARA

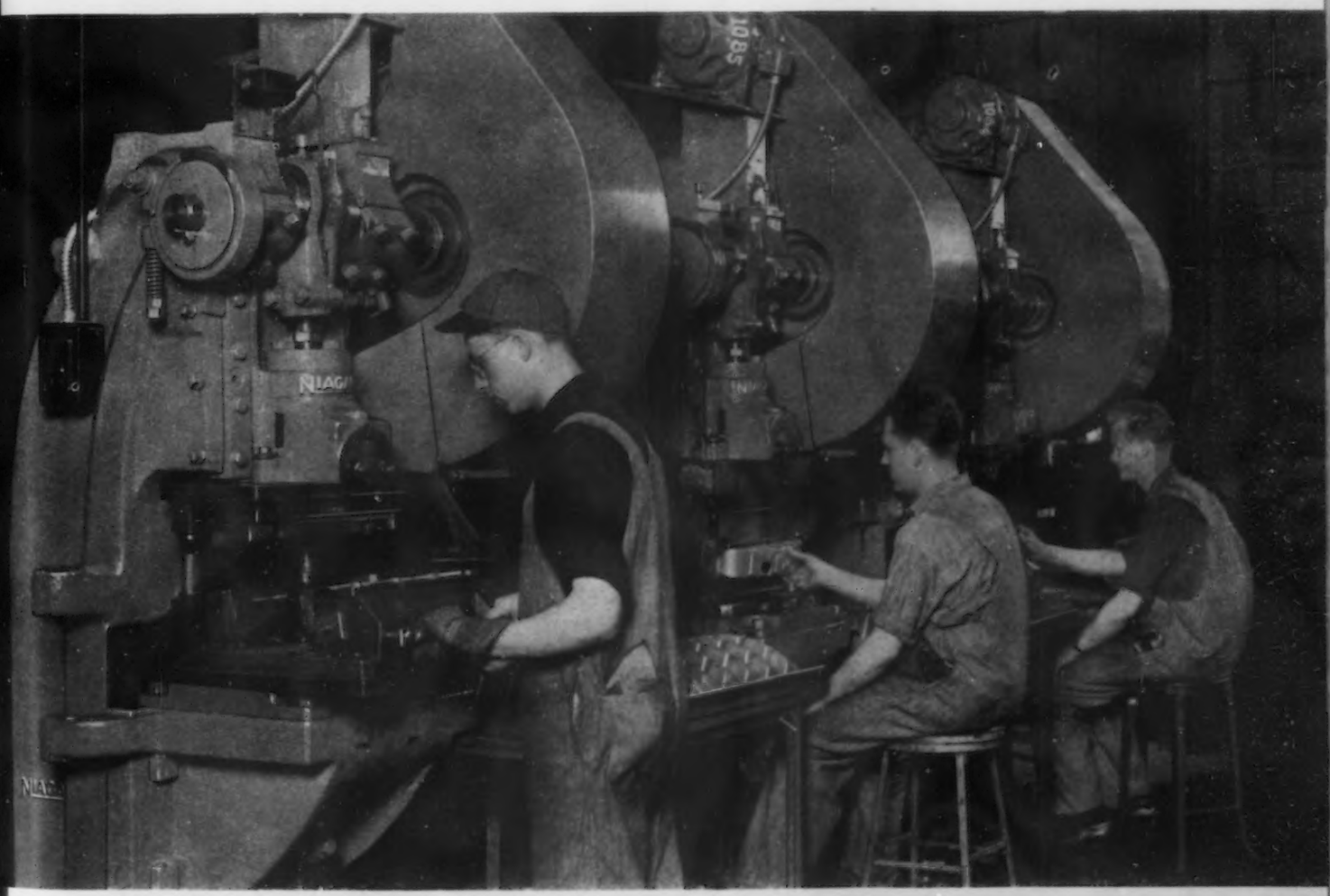
NIAGARA MACHINE AND TOOL WORKS, BUFFALO, N. Y.
NEW YORK . . . DETROIT

STRENGTH, rigidity, accuracy, more strokes per hour, long die life, safety, reliability, low maintenance cost are results of the engineering talent and experience that is built into the latest type Niagara Presses and Shears.

The many new and exclusive developments in Niagara Presses include steel casting and high tensile cast iron frames . . . patented 14-point engagement sleeve clutches with built-in single stroke mechanism, strong, rigid slides with Breech Block die clamp, adjustable and removable single, and multiple V gibs, motor drive and anti-friction back gear assembly up out of way of operators and work in process, one-man inclining mechanism with anti-friction bearings, controls and working height arranged for operators' convenience.

In addition, latest type Niagara Power Squaring Shears offer accurate flat cutting of narrow strips, triangular section crossheads, smooth holddown operation, clear vision of cutting line, no obstructions in rear, massive cast beds, enclosed drive mounted on anti-friction bearings running in oil, genuine Niagara knives.

Write for Bulletins.



NIAGARA

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NEW YORK . . . DETROIT

Century
FRACTIONAL HORSE POWER MOTORS
CHARACTERISTICS AND APPLICATIONS
SOME THINGS WE MAY HAVE FORGOTTEN ABOUT MOTORS

THIS BOOK *tells..*

HOW *to* SELECT *the* RIGHT MOTOR

This New 24-page book will be of real assistance to you . . . Here is presented in helpful form information concerning the electrical characteristics of all types of Fractional Horse Power Motors—and suggestions as to how they can be most effectively applied to meet the requirements of motor-driven machinery and appliances operating in normal or abnormal surroundings . . . Fully illustrated . . . Send for your copy, if you have not received it . . . **ASK FOR BULLETIN 1039-N . . .**

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Century MOTORS

UP TO 600 HORSE POWER

Why do Black & Decker High Cycle Tools

Increase Production without Increasing Costs?

Because they Maintain Speed and Power under Load

YOUR most important production cost is labor. So the problem of increasing production and keeping costs down is mainly a matter of helping the operator turn out his full quota of work every day.

High Cycle Tools do this because they operate at top efficiency all the time—registering a decrease in power of only 20% between no-load and stall points, while other types show reductions up to 60% under the same working conditions.

Because of their high efficiency—and also because of their low power costs, service and power supply maintenance costs—modern manufacturers in large numbers are swinging to High Cycle Tools to speed production and cut costs.

Will High Cycle Tools Reduce Your Production Costs?

They've already done so for manufacturers using from as few as 10 to as many as 1,000 portable tools. It's easy to find out whether they will do the same for you. Our High Cycle Engineers will gladly make a survey of your plant and give you an accurate report—without cost or obligation. For further information and catalog, write: High Cycle Division, The Black & Decker Mfg. Co., 751 Pennsylvania Avenue, Towson, Maryland.

Black & Decker

BLACK & DECKER

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LUDLOW-SAYLOR
St. Louis:

Send the following bulletins

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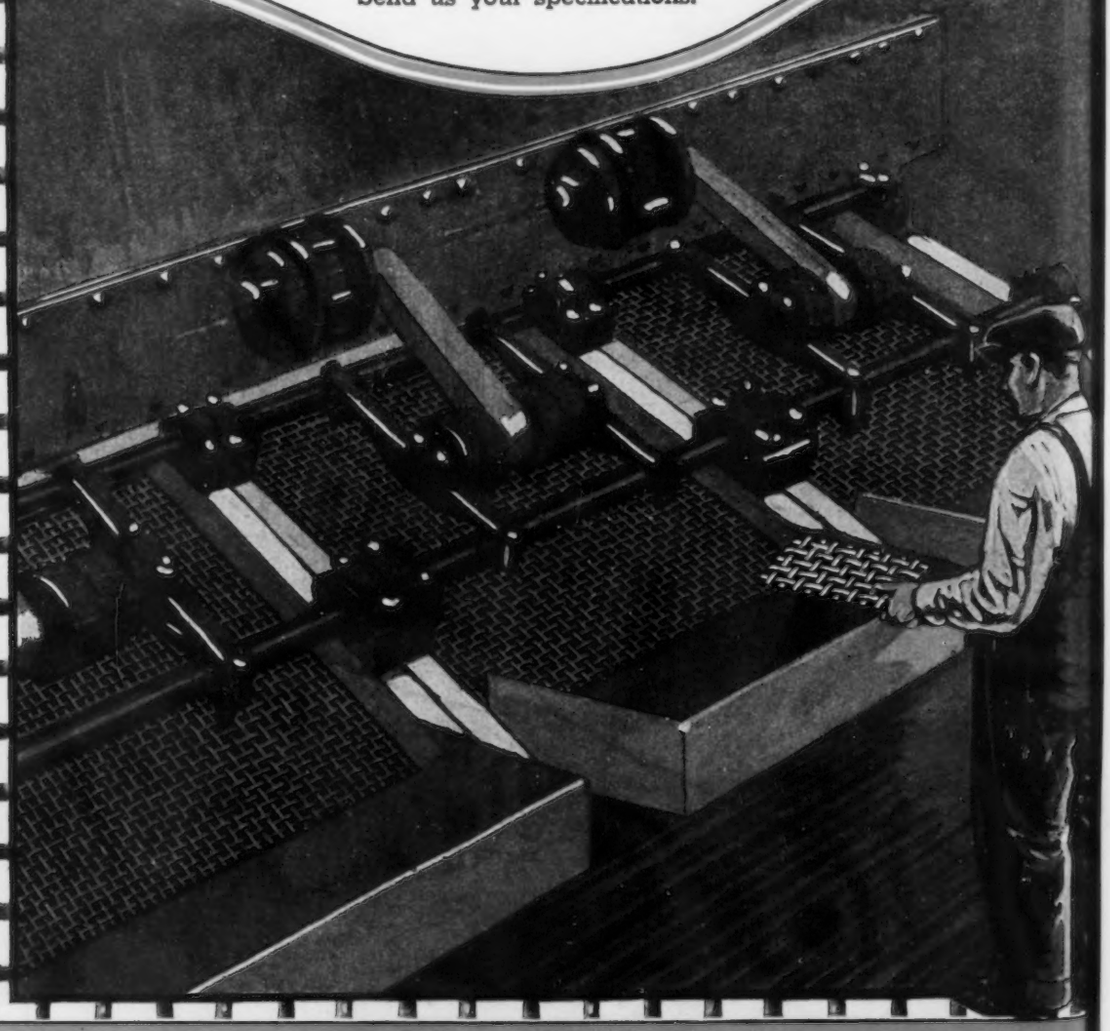
Give Yourself a "Perfect" Start

toward a prosperous New Year

Study our samples of "Perfect" wire cloths and screens, and carefully check their qualities and prices. Our tremendous stocks permit immediate shipments of several thousand weights and widths and weaves, in all standard metals and alloys—plain steel, galvanized steel, stainless steel, brass, bronze, copper, aluminum, etc.; any special requirements are quickly made up to order.

Inquiries for prices are answered fully and promptly, and every order receives immediate, careful attention.

Send us your specifications.

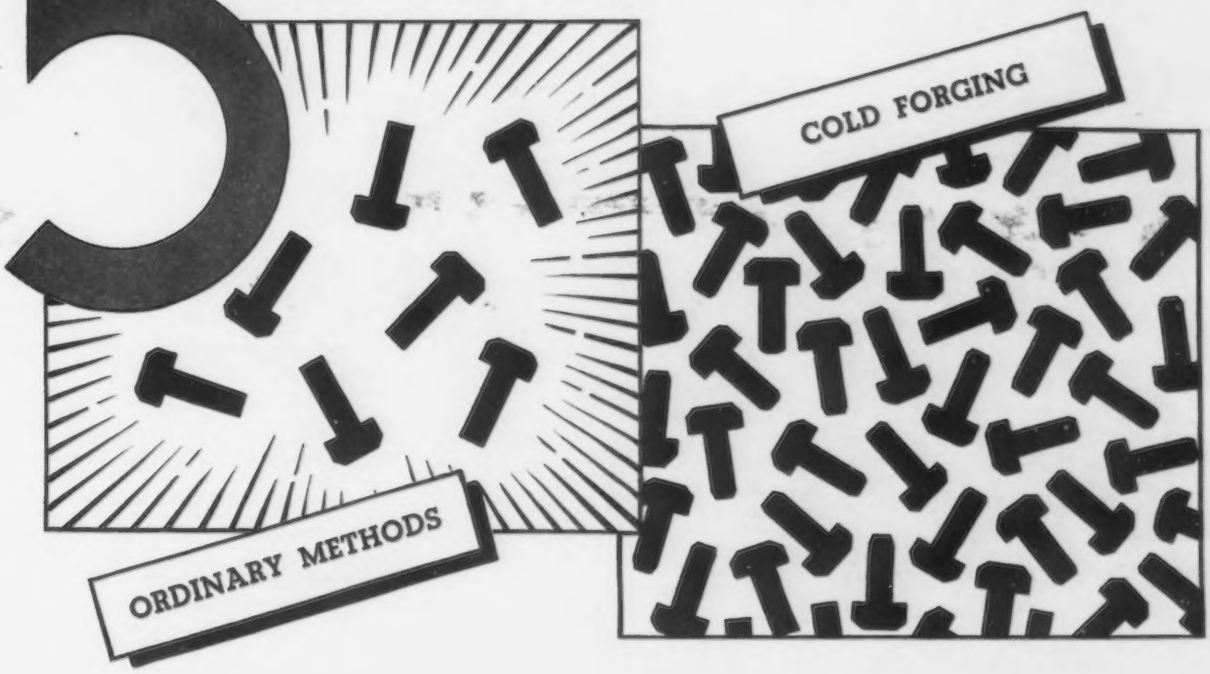


The LUDLOW-SAYLOR WIRE COMPANY ST. LOUIS

600-616 S. NEWSTEAD AVE.

March 1, 1937

5 MINUTES' OUTPUT

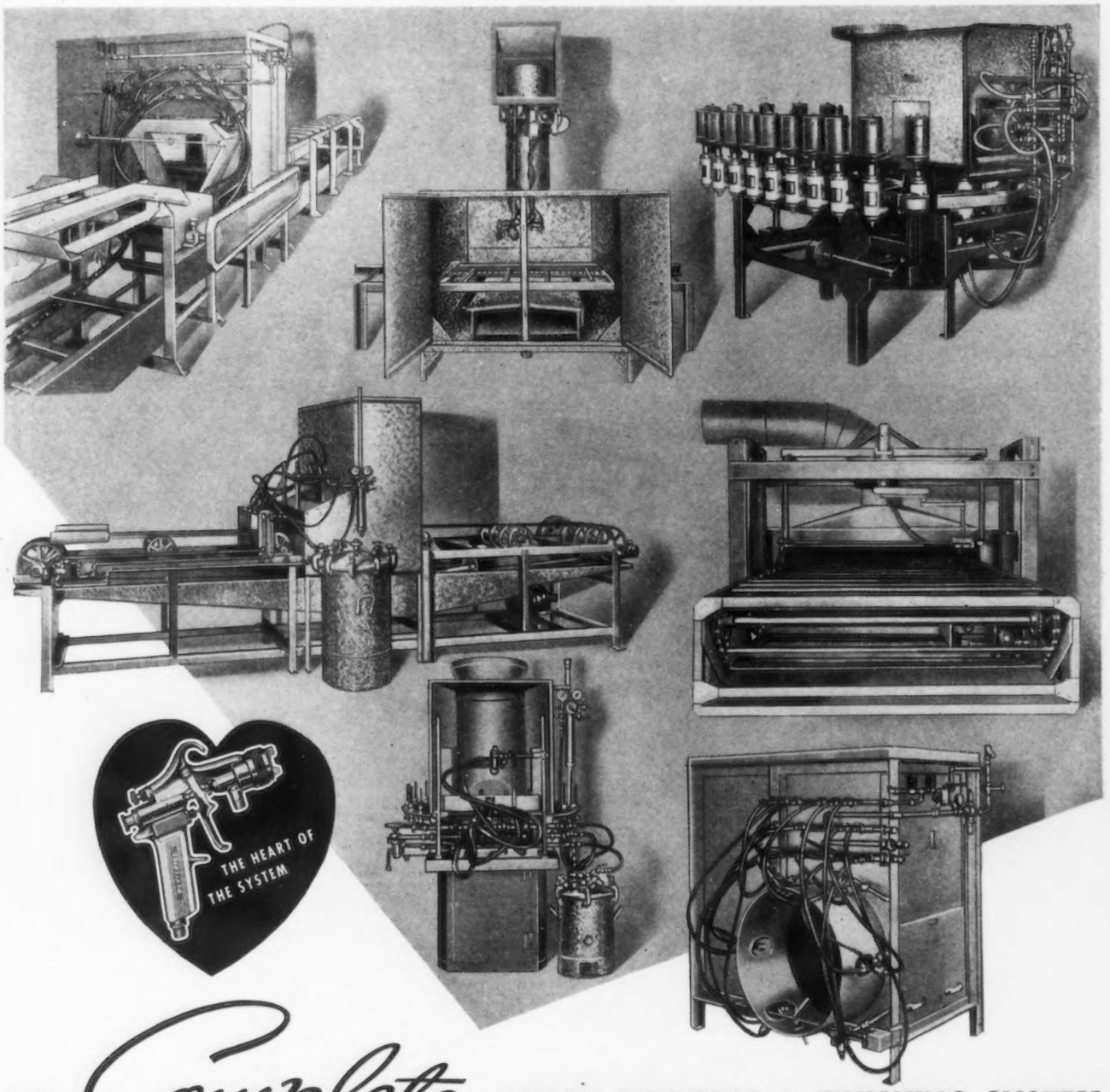


● The rough comparison between slower methods and cold forging shows why the swing is to cold forging. Why shouldn't manufacturers of small parts change over to the method that gets work out so fast? Manville cold forging machines shoot production way up . . . yet cut down stock costs, manual operations and production steps. Stock waste is wiped out entirely. The finished blank is often stronger due to improved grain.

In addition to high-speed cold headers Manville makes other money-saving cold forging machines. Automatic Bolt Head Trimmers that do a clean-cut job quickly. Screw Thread Rollers accurate enough for micrometer threads. And Screw Slotters, too. Manville works up many new applications of cold forging yearly. Better find out if you can switch to this modern method. Send us samples of your small parts.

E. J. Manville Machine Co., Waterbury, Conn.
1209 Swetland Building, Cleveland, Ohio

MANVILLE
COLD FORGING MACHINES



THE *Complete* SPRAY-PAINTING & FINISHING SYSTEM

The complete DeVilbiss Spray-Finishing System includes a broad variety of special equipment for high speed production line finishing or coating of objects small and large from lip-stick holders to steel sheets . . . DeVilbiss engineers almost daily design special spray guns, nozzles, spray equipment and accessories, automatic and semi-automatic machines and exhaust equipment for use with unusual finishing materials, for operation under difficult conditions or to meet some special production necessity. Years of development in standard and special equipment have solved almost every kind of finishing problem. But new products, finishing materials and operating methods constantly present new equipment requirements . . . The DeVilbiss engineering staff, research and experimental laboratories and a nation-wide organization of experienced field representatives are always available to help you solve your finishing problems no matter how simple or complicated they may be.

SPRAY GUNS · MATERIAL CONTAINERS
REGULATORS · SPRAY BOOTHS · EXHAUST
FANS · AIR COMPRESSORS · HOSE AND
HOSE CONNECTIONS · ACCESSORIES

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• Right out of stock—for we maintain a stock of 30 *million* cap and set screws at our four warehouses and the factory for our customers' convenience. A full list of sizes, packed in cartons and kegs, both American fine and coarse threads, including hexagon, fillister and flat head cap screws, square head and headless set screws are always available to meet your urgent demands. Ask for Catalog E and current price list.

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CLEVELAND CAP SCREWS

SET SCREWS • BOLTS AND NUTS

Address the Factory or our Nearest Warehouse: Chicago, 726 W. Washington Blvd. • Philadelphia, 12th & Olive Streets
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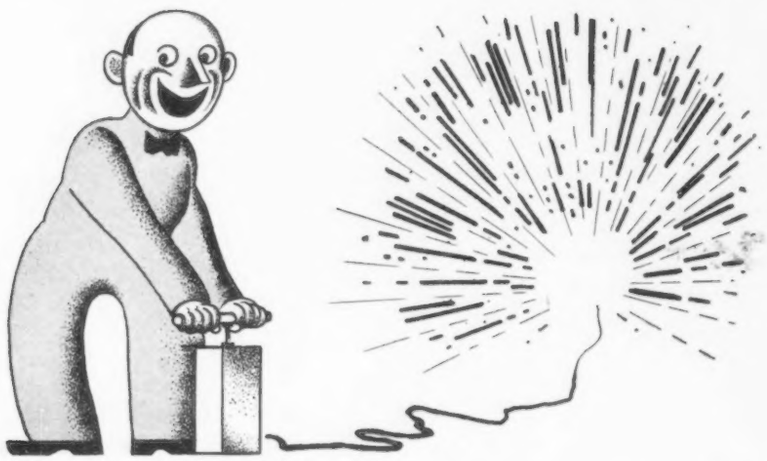
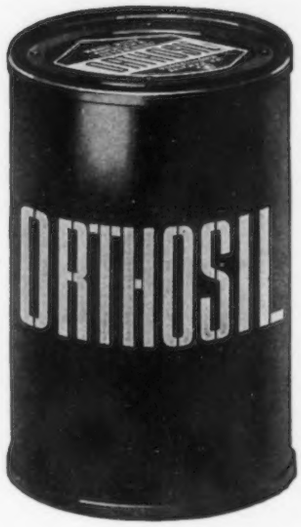
ORTHOSIL

TRADE MARK

Blasts off the dirt and oil in electrolytic metal cleaning





ORTHOSIL solutions are better conductors of electricity than those of almost any other alkaline salt in similar concentrations. The notably low surface tension of Orthosil solutions enables them to penetrate beneath the dirt and oil film on the surface of the metal being cleaned.

These solutions get into the pores of the metal . . . making contact and generating bubbles of gas in copious quantity. Grease and dirt are lifted violently from the metal during electrolytic cleaning . . . literally blasted into the Orthosil solution.

Orthosil is an *anhydrous* granular material unhampered by inert salts and relatively weak alkaline diluents. In the heavy-duty cleaning of metals it is outstanding for its quick action. Try Orthosil . . . check its advantages against those of any other industrial detergent. Write for full details — address Department E.

1. **Particularly efficient in electrolytic cleaning due to its high conductivity.**
2. **Assures quicker action than other alkalis.**
3. **Prevents grease and dirt from re-depositing.**
4. **Easy to pour, quick to dissolve.**
5. **Anhydrous—highly concentrated—economical.**
6. **Quickly removes the grease, soot, dust, and various kinds of dirt unaffected by pickle acid.**
7. **Leaves material *clean* for further processing.**

PENNSYLVANIA SALT MANUFACTURING COMPANY · Est. 1850

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A REVIEW OF CURRENT CATALOGS AND CIRCULARS • A TIME SAVING SERVICE FOR BUYERS

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STEAM TRAPS, REGULATORS, ETC.—Sarco Co., Inc. New Sarco hook-up book containing detailed suggestions on the use of steam traps, temperature regulators and other accessories. Blue prints show correct method of applying steam traps to various industrial equipment, and photographs show construction features. Bulletin 12-118.

NICKEL ALLOY STEELS.—International Nickel Co., Inc. Bulletin describes the use of nickel alloy steels in hand tools where high strength, toughness and light weight are required. Tables give mechanical properties of various nickel alloys. Bulletin 12-119.

LATHES, PRESSES and SHAPERS.—Atlas Press Co. Lathes, drill presses, arbor presses and shapers are pictured and described in general catalog No. 28. Catalog also covers two new machines; a shaper with 7-in. stroke, and a back-geared screw-cutting lathe with 6-in. swing. Bulletin 12-120.

FLEXIBLE COUPLINGS.—Baldwin-Duckworth Chain Corp. Bulletin No. 63 describes roller chain flexible couplings, illustrates their application and gives horse power ratings of couplings and service factors for various types of drives. Prices of replacement chains also included. Bulletin 12-121.

HIGH TEMPERATURE STEELS.—Timken Roller Bearing Co. Large folder presents technical data relating to the various properties of Timken seamless tubes in a readily accessible manner. This guide will be of value to specifying engineers. Bulletin 12-122.

ACID-PROOF CEMENTS.—Quigley Co. Bulletin describes acid-proof cements designed to meet the requirements of chemical and metallurgical industries, public works and utilities. Cement is available in three grades to meet various operating problems. Typical applications are illustrated. Bulletin 12-123.

SOLUBLE CUTTING OIL.—D. A. Stuart Oil Co., Ltd. 20 page booklet discussing uses of "Kleen-Kut" cutting oil. Includes technical data and illustrations. Bulletin 12-124.

FORGINGS.—A. Finkl & Sons Co. One hundred and four page catalog discussing the company's chrome nickel molybdenum steel. Characteristics of the more widely used types and principal products made therefrom, actual photographs of products, charts of physical properties, technical data and official S.A.E. standard steel specifications are included. Bulletin 12-125.

SPEED REDUCERS AND CUT GEARS.—D. O. James Mfg. Co. Binding containing 431 pages, including separate catalogs on continuous tooth herringbone speed reducers and gears; worm, helical worm and double worm gear speed reducers; right angle spiral bevel gear speed reducers; spur gear reducers and complete catalog on all types of cut gears. Also includes discount sheets and price lists. Bulletin 12-126.

PARTS WASHING MACHINES.—G. S. Blakeslee & Co. Thirty-page illustrated catalog covering machines for cleaning all kinds of metal parts by hydraulic process. Washing principle is described and partial list of users is included. Bulletin 12-127.

AUTOMATIC WEIGHING MACHINES.—Streeter-Amet Co. Automatic weight printing device for attachment to beam of railroad track scales is described in an illustrated folder. Cars may be weighed in motion, coupled or uncoupled. Construction and operation explained and capacities are given. Bulletin 12-128.

COOLING COILS.—Young Radiator Co. Catalog containing illustrations and descriptive text, technical data and diagrams of cooling coils for use with water or brine. Bulletin 12-129.

RESISTENCE WELDER.—Armglo Co. Folder describing the "Economy" bench type resistence spot welder. Table of weights and specifications included. Bulletin 12-130.

HYDRAULIC RIVETER.—Hannifin Mfg. Co. Folder describing and illustrating 35-ton "Hy-power" portable hydraulic riveter designed for riveting operations on structural steel and similar work. Specifications are included. Bulletin 12-131.

LUBRICATION.—Standard Oil Co. of Indiana. Bulletin explaining value of lubrication engineering, discusses cases where lubrication engineers have effected savings. Bulletin 12-132.

LATHE GRINDER.—The Dumore Co. Profusely illustrated catalog describing and picturing lathe grinders, tools and accessories. Comparative specifications of various types of grinders are included. Bulletin 12-133.

GAS FLOW CONTROL.—Shallcross Controls, Inc. Folder describing and illustrating diaphragm type high pressure ratio switch for the control of flow of two or more gases. Applications include open-hearth reheating and billet furnaces, soaking pits, blast furnaces, stove burners, etc. Bulletin 12-134.

COUNTERBORING TOOLS, SPLINE-TAPER DRIVE.—National Twist Drill & Tool Co. 16-page bulletin describing and illustrating the new line of heavy-duty, spline taper drive interchangeable counterboring tools and inverted spotfacers. Dimensional data and prices are given for counterbore holders, both taper and straight shank, counterbore cutters, countersinks, pilots and pilot nuts for both types of tools. Some unusual applications are also illustrated with line drawings. Bulletin 12-135.

CLUTCH FOR PRESSES AND SHEARS.—Niagara Machine & Tool Works. Bulletin pointing out the features of the new 14-point engagement sleeve clutch used on Niagara power presses and shears. Bulletin 12-136.

HYDRAULIC GRINDERS.—Landis Tool Co. New catalog No. E-37 describes 16 in. type B plain hydraulic grinders. Machines feature babbitt-lined steel wheel spindle bearings, multiple V-belt drive on end grinding wheel spindle and hydraulic table traverse. Complete specifications and list of standard equipment included. Bulletin 12-137.

FRACTIONAL HORSEPOWER MOTORS.—Century Electric Co. 24-page booklet presents information concerning the electrical characteristics and descriptions of all types of fractional horsepower motors, with suggestions as to how they can be most effectively applied to meet the requirements of motor-driven machinery operating in normal and abnormal surroundings. Bulletin 12-138.

FRICTION CLUTCHES.—T. B. Wood's Sons Co. A new flexible clutch designed especially for use on oil, gas and diesel engine drives, or on drives where heavy impact is encountered on either end, is described in this bulletin. Large cutaway drawing illustrates construction features. Bulletin 12-139.

WELDING GENERATORS.—Harnischfeger Corp. The difference between separate and self-excited generators for arcwelding, as well as the characteristics of external and internal stabilizations are described with the help of curves, photographs and diagrams. Also discussed are single current control versus double manual control. Bulletin 12-140.

AIR FURNACES.—Despatch Oven Co. Bulletin describing and illustrating with photographs, charts and diagrams, convected air furnaces for heat treating dense and coarse loads. List of users and typical products treated is included. Bulletin 12-141.

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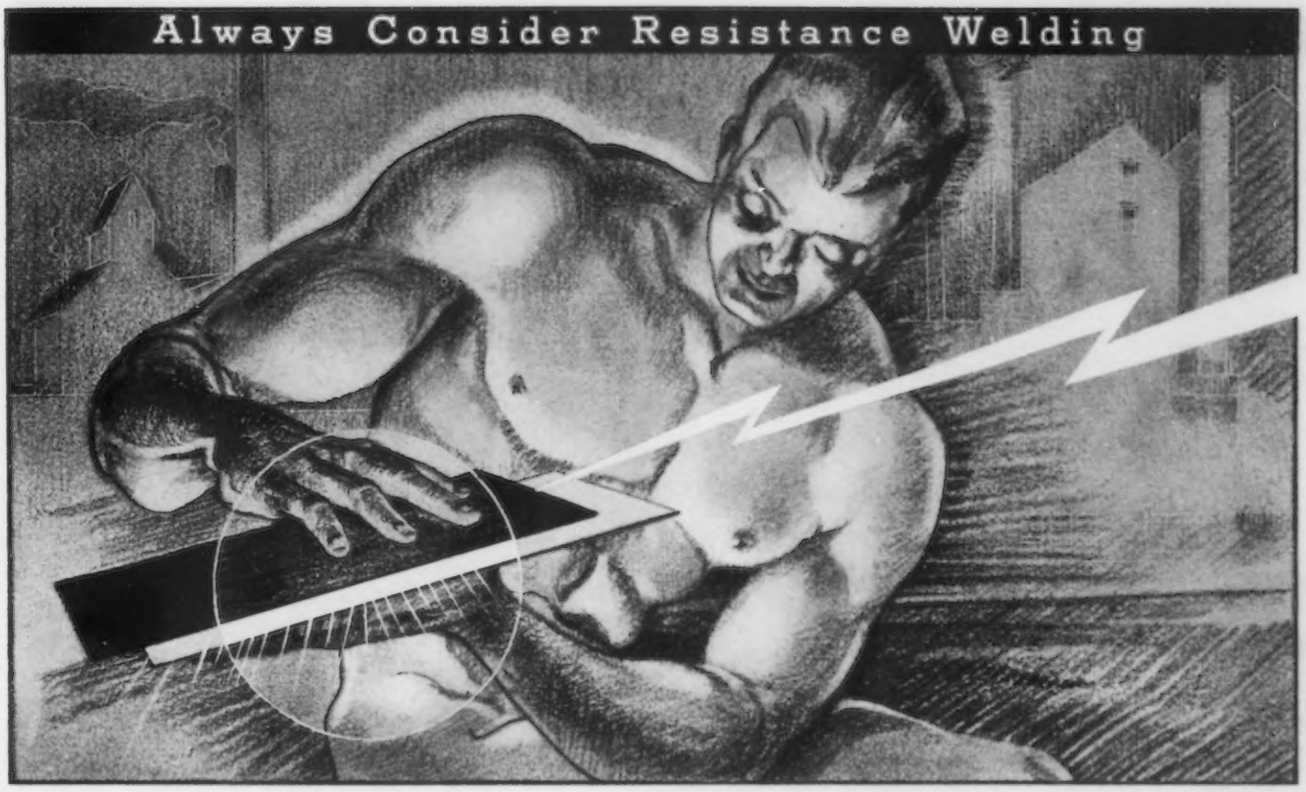
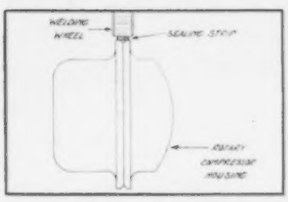


RESISTANCE WELDING • *a Great Advancement in Metal Fabrication*



The accompanying drawing shows briefly the general design of compressor housing and metal strip being welded around the edges to seal joint and make pressure tight.

New possibilities for lowering manufacturing costs, speeding up production, strengthening products and improving design are being found, every day, in the application of Resistance Welding to replace old and obsolete methods. Such great progress has been made in this field that Federal Engineers challenge any industry to submit jobs they consider impossible to weld, claiming the chances are ten to one it can be done.

An example is given in the special seam welder illustrated, designed by Federal Engineers for the refrigerator industry to weld two stampings around the edge of a pressure type compressor housing. To prevent oil in such stampings from getting in the juncture where the weld is to be made either before or at time of welding, this special welder was built on an angle. The oil then remains in the lower half of the compressor housing until after the weld is completed.

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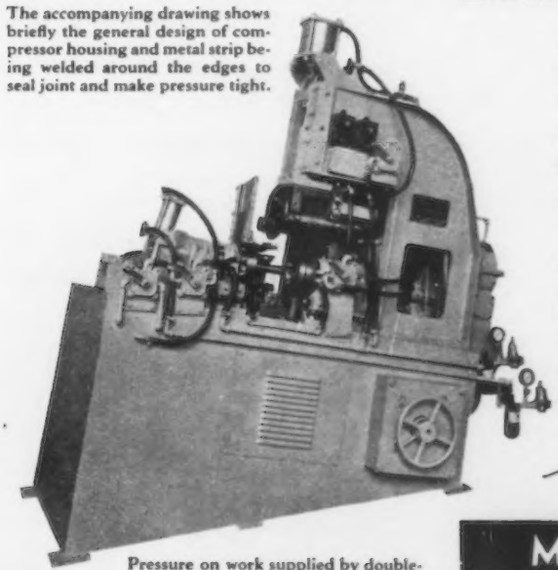

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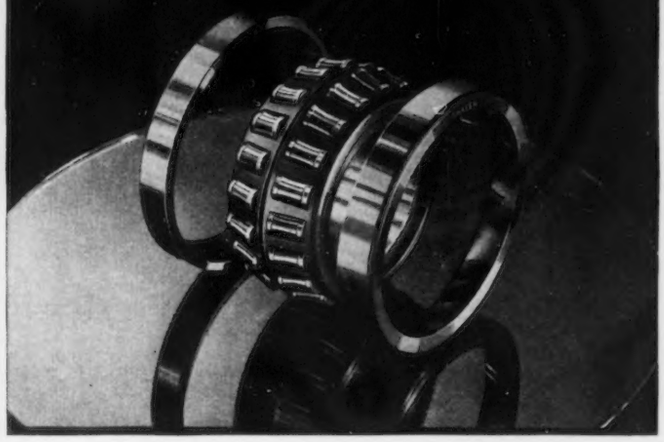

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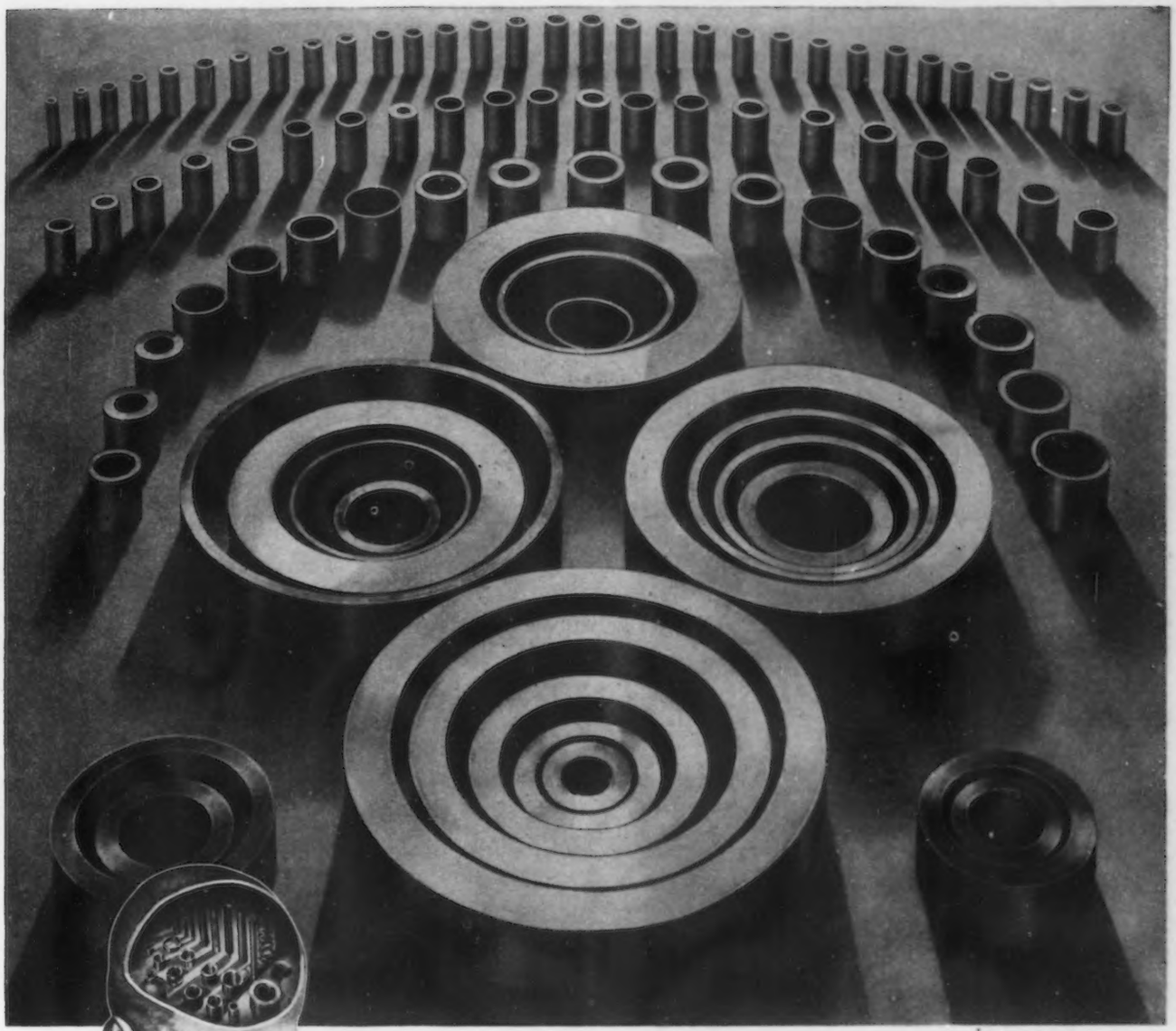

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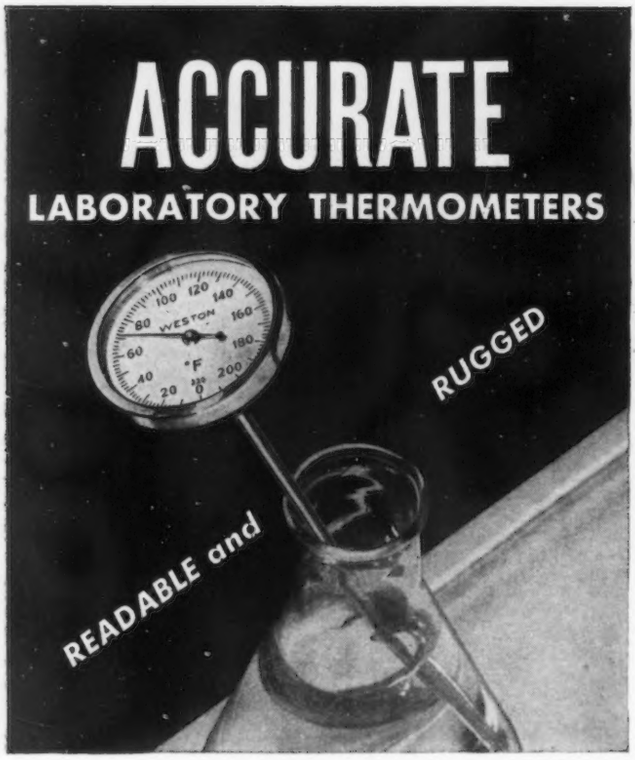

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Now It's Done in 120 Seconds

"*HE started as a carbon boy in 1880,*" reads the obituary of Homer D. Williams, former president of Carnegie Steel Co.

Never before having heard of a carbon boy, we asked one of the thirty-year-old graybeards in the Editorial Dept. and learned that his duty was that of rushing specimens of a heat to the laboratory for carbon analysis.

The carbon boy was done out of a job by pneumatic tubes which whisk samples from furnace to lab before you can name the all-American backfield. And now a new-fangled device called a carbometer, installed right on the open-hearth floor, gives the furnace operator a carbon analysis in 1.75 jiffies.

Mary Makes It Five

AS one who is strong for realism in a modest way, we object to your favorite family journal permitting its artists to idealize the men who toil at the lathe, the hearth, the cupola, the assembly line and so on.

Invariably they are pictured as full-chested, flat-bellied, slim-waisted, broad-shouldered and brawny-armed—like so many carbon copies of Lionel Strongfort before he had to have that V put in the back of his pants.

It may be art but it ain't so. You see as many pot-bellied, sway-backed individuals feeding stamping presses or running a forging hammer as you do sitting at desks. Or maybe they are skinny, with ambitious Adam's apples.

Not that we care, but Mary of Rock Island, Ill., who postcards us that she makes the women readers of this column a quintette, reducing the men readers to an unlucky thirteen, might get the wrong idea.

Stopper

DIRT Takes a Holiday—New Departure.

Victory for Common Sense

NOTHING handicaps a product so much as a trade name which is difficult to pronounce. Robbins & Myers are making a pump which operates by an entirely new principle. For Mary's benefit we will explain that a helical, eccentric rotor rolls with a hypocycloidal motion in a stator moulded to form an internal double helix.

A Frenchman named Moineau invented it. Did R. & M. call it the *"Moineau"* and explain laboriously that it is pronounced *"Mwah-noe"?* Nope. They boldly Americanized both spelling and pronunciation. *"Moyno"* it is, and you can't get it wrong regardless of which side of the railroad track you were born on.

One Fumble

SOMETIME we will prepare a curve of the ascending number of inquiries that come into the Reader Service Dept., and this we will exhibit to the Oberleutnant to show what keeps us in some nights until almost five o'clock.

We are not complaining, for we look upon answering inquiries as something in the nature of the white-collar man's burden. So if ever you feel impelled to test our good nature and omniscience, come ahead. We will probably pass it along anyway to someone in the Editorial Department who knows the answer offhand.

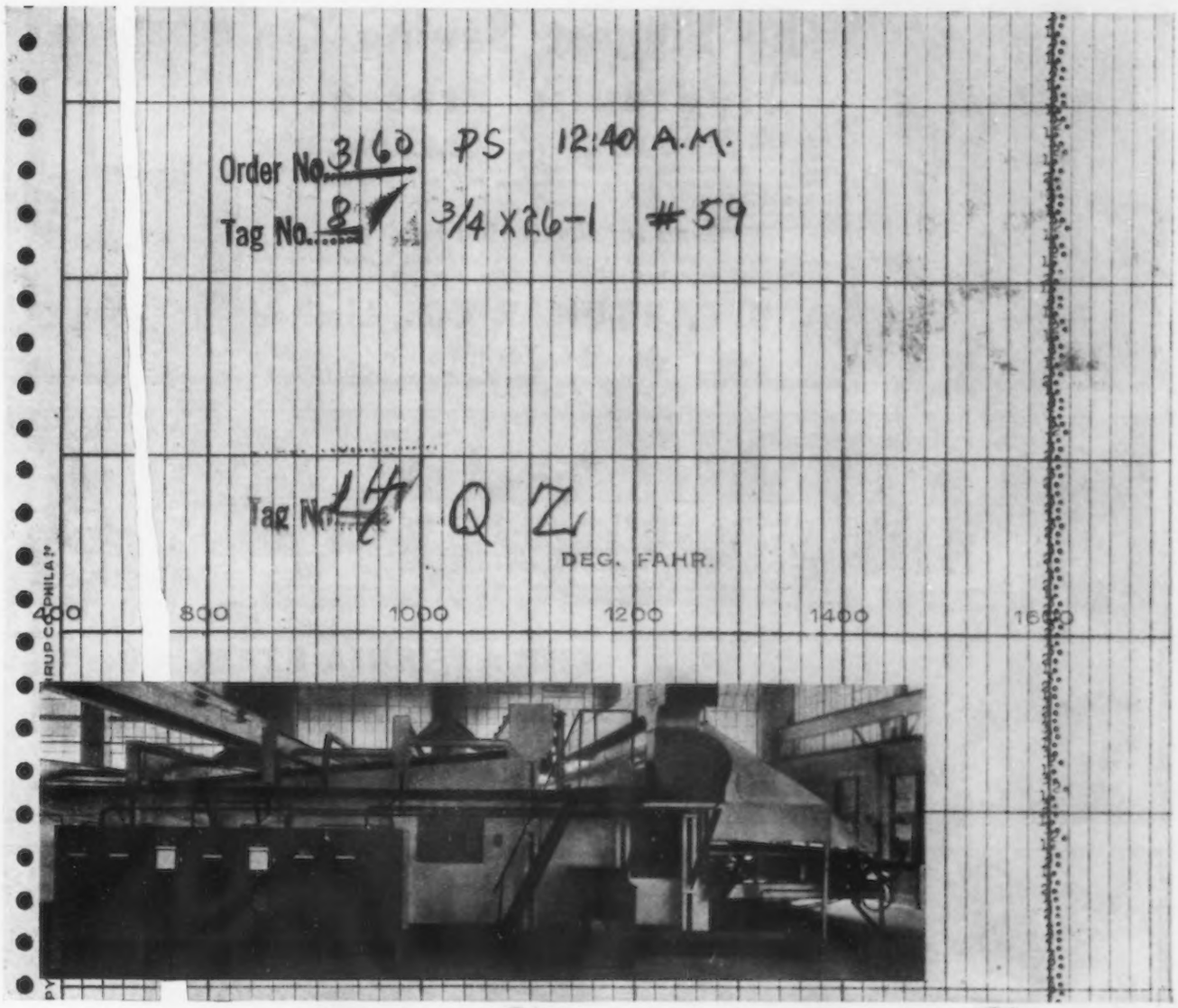
However, one did come in the other day that made us say "Uncle." Someone said he heard that James J. Hill declared back in 1912 that the railroads were consuming two-thirds of the steel. Although it sounded screwy we looked faithfully through the issues of a quarter of a century ago and all we could find about James J. was what he told a Congressional committee which had suspicions about a hook-up between his railroad and a coal company.

With a Bow to the T. L. Isle

IF you put your mind to it you can cook up a sweet-sounding name for almost anything, even if the thing itself is not especially gladsome. For instance, collection departments are now credit departments. The installment plan becomes "easy payment," and we could go on but we can't think of any more examples.

What brought this up in the first place is the cleverness of the English in coining the phrase "loyalty rebate" for the discount given to pig iron purchasers who promise not to buy from outlanders. The injection of the patriotic note into a sales-stimulating device is a stroke of genius.

—A.H.D.



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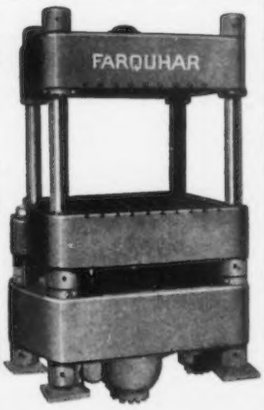

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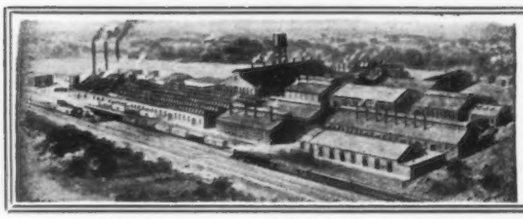

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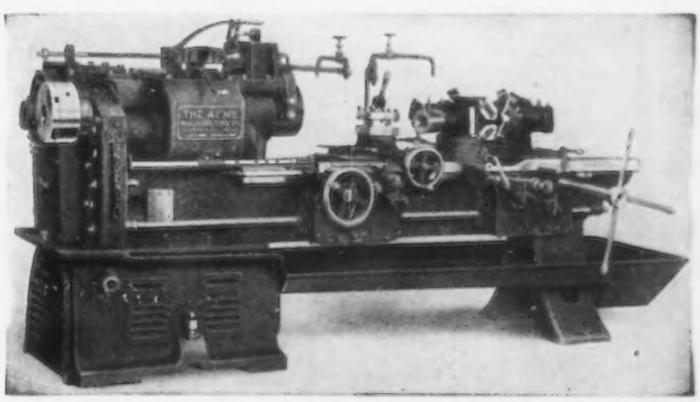

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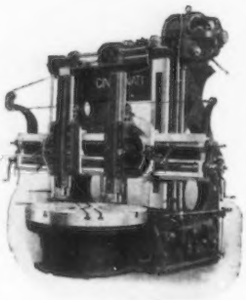

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ACCESSORIES—Welding
Lincoln Electric Co., The, Cleveland.

ACCUMULATORS—Hydraulic
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ALLOYS—Resistance Welding
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ALLOYS—Titanium
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ALLOYS—Vanadium
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

ALLOYS—Zinc Base Die Casting
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

ALUMINUM
Aluminum Co. of America, Pittsburgh.
Seligman, Arthur, & Co., Inc., 30 Rockefeller Plaza, R. C. A. Bldg., N. Y. C.

AMMETERS AND VOLTMETERS—Recording
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AMMONIA RECOVERY PLANTS
Koppers Co., Pittsburgh.

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Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Ryerson, Jos. T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago
Steel & Tubes, Inc., Cleveland.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Weirton (W. Va.) Steel Co.

ANGLES, BEAMS, CHANNELS & TEES—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

ANNEALING—See Heat Treating

ANNEALING BOXES
Lebanon (Pa.) Steel Foundry.
United Engineering & Fdry. Co., Ptgh.

ANNEALING COVERS
Surface Combustion Corp., 2375 Dorr St., Toledo.
Wilson, Lee Engineering Co., The, Cleveland.

ANODES—All Types
Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.
Seymour (Conn.) Mfg. Co.
Udylite Co., The, Detroit.

ANODES—Cadmium
Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.
Udylite Co., The, Detroit.

ANODES—Lead
National Lead Co., 111 Bdway., N. Y. C.

APPAREL—Welding
Lincoln Electric Co., The, Cleveland.

ARBORS
Cincinnati (Ohio) Milling Mch. Co., The.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

ARMORING MACHINERY—Cable, Wire, Hose
Sleeper & Hartley, Inc., Worcester, Mass.

ARRESTERS—Spark
Harrington & King Perforating Co., Chicago.

AXLES—Car or Locomotive
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

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Cadman, A. W., Mfg. Co., Pittsburgh, Pa.
National Lead Co., 111 Bdway., N. Y. C.

BALANCING MACHINES — Static Dynamic
Gisholt Machine Co., Madison, Wis.
Olsen, Tinius Testing Machine Co., Philadelphia.

BALING PRESSES—Scrap — See Presses—Baling

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Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
Hartford (Conn.) Steel Ball Co., The.

BALLS—Steel, Brass or Bronze
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
Hartford (Conn.) Steel Ball Co., The.
New Departure Div., General Motors Corp., Bristol, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.

BANDS—Steel
Acme Steel Co., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BANDS—Welded
Amer. Welding & Mfg. Co., Warren, O.

BARRELS—Burnishing
Abbott Ball Co., The, 1047 New Britain Ave., Hartford, Conn.
Ransohoff, N., Inc., Cincinnati.

BARRELS—Tumbling
Baird Mch. Co., The, Bridgeport, Conn.
Hartford (Conn.) Steel Ball Co., The.
Ransohoff, N., Inc., Cincinnati.
Whiting Corp., Harvey, Ill.

BARS—Alloy
Republic Steel Corp., Cleveland, Ohio.

BARS—Aluminum
Aluminum Co. of America, Pittsburgh.

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Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

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Bliss & Laughlin, Inc., Harvey, Ill.
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Jones & Laughlin Steel Corp., Pittsburgh.
Laclede Steel Co., St. Louis, Mo.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

BARS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

BARS—Rustless
Rustless Iron & Steel Corp., Baltimore, Md.

BARS—Steel
Bethlehem (Pa.) Steel Company.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Great Lakes Steel Corp., Detroit.
Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Steel & Tubes, Inc., Cleveland.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
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Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co., The.

BATTERIES—Storage
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USL Battery Corp., Niagara Falls, N. Y.

BATTERY CHARGERS
Cutler-Hammer, Inc., Milwaukee.

BEAMS—See Angles, Beams, Channels and Tees

BEARINGS—Babbitt
Cadman, A. W., Mfg. Co., Pittsburgh, Pa.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.

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Bantam Bearings Corp., The, South Bend, Indiana.
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.

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Schatz Mfg. Co., Poughkeepsie, N. Y.

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Ampco Metal, Inc., Milwaukee, Wis.
Bunting Brass & Bronze Co., Toledo, O.
Johnson Bronze Co., 505 So. Mill St., New Castle, Pa.
Lawrenceville Bronze Co., Pittsburgh.
National Bearing Metals Corp., Pittsburgh.

BEARINGS—Oilless
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Rhoades, R. W., Metaline Co., Inc., Long Island City, N. Y.
Richardson Co., The, Melrose Park, Ill.

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Bantam Bearings Corp., The, South Bend, Indiana.

BEARINGS—Radial
Bantam Bearings Corp., The, South Bend, Indiana.
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
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Norma-Hoffmann Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

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Morgan Construction Co., Worcester, Mass.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Shafer Bearing Corp., 35 East Wacker Drive, Chicago.
Timken Roller Bearing Co., The, Canton, O.

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Bantam Bearings Corp., The, South Bend, Indiana.
Hyatt Bearings Div., General Motors Corp., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Shafer Bearing Corp., 35 East Wacker Drive, Chicago.
Standard Machinery Co., Providence, R. I.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Roller Tapered
Bantam Bearings Corp., The, South Bend, Indiana.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Rolling Mill Equipment
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Richardson Co., The, Melrose Park, Ill.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS—Self-aligning Roller
Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

BEARINGS—Shaft Hanger
Hyatt Bearings Div., General Motors Corp., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
Shafer Bearing Corp., 35 East Wacker Drive, Chicago.

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SKF Industries, Inc., Front St. & Erie Ave., Phila., Pa.
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Shafer Bearing Corp., 35 East Wacker Drive, Chicago.
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Rhoads, J. E., & Sons, Philadelphia.

BELT LACING
Rhoads, J. E., & Sons, Philadelphia.

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Goodyear Tire & Rubber Co., Akron, Ohio.
Goodrich, B. F., Co., The, Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

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Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.
Rhoads, J. E., & Sons, Philadelphia.

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Cambridge (Md.) Wire Cloth Co.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

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Goodrich, B. F., Co., The, Akron, Ohio.
Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.
Robins Conveying Belt Co., 15 Park Row, N. Y. C.

BELTS—V-Type
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Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

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BERYLLIUM COPPER
American Brass Co., The, Waterbury, Conn.

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Rustless Iron & Steel Corp., Baltimore, Md.

BILLETS—Chrome Steel
Rustless Iron & Steel Corp., Baltimore, Md.

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Republic Steel Corp., Cleveland, Ohio.

BILLETS—Re-rolling
Alan Wood Steel Co., Conshohocken, Pa.

BILLETS—Steel
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Continental Steel Corp., Kokomo, Ind.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

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Chace, W. M., Co., 1695 Beard Ave., Detroit.

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Frick-Gallagher Mfg. Co., The, Wellston, Ohio.

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Cleveland Steel Tool Co., The, 660 E. 82nd St., Cleveland, Ohio.

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Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.
Richardson Co., The, Melrose Park, Ill.

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Waldron, John, Corp., New Brunswick, N. J.

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American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.
Pangborn Corporation, Hagerstown, Md.

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American Blower Corp., 6000 Russell St., Detroit.
Ingersoll-Rand Co., 11 Broadway, N. Y. C.
North American Mfg. Co., The, Cleveland
Spencer Turbine Co., Hartford, Conn.

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Weldit Acetylene Co., Detroit.

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American Gas Furnace Co., Elizabeth, N. J.
Weldit Acetylene Co., Detroit.

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BOILERS—Waste Heat
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILERS—Water Tube
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

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Landis Mch. Co., Inc., Waynesboro, Pa.

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Acme Machinery Co., Cleveland.
Ajax Mfg. Co., The, Euclid, Ohio.
Landis Machine Co., Inc., Waynesboro, Pa.
Manville, E. J., Mch. Co., Waterbury, Ct.
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Erie (Pa.) Bolt & Nut Co.
Lamson & Sessions Co., The, Cleveland.
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Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

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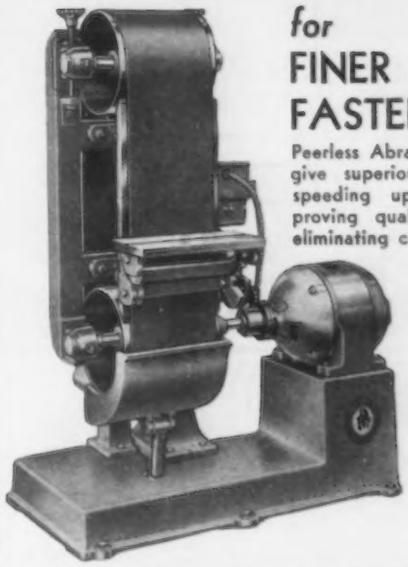

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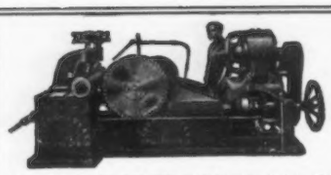

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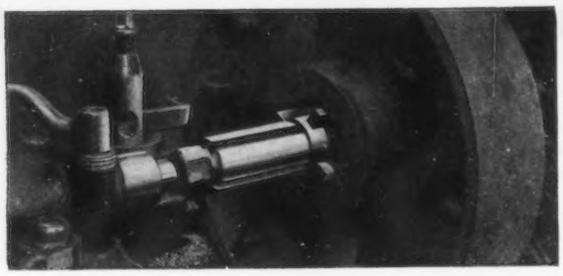

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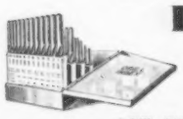

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Ferguson, H. K., Co., The, Cleveland.
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BURNERS—Oil or Gas
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Wilson, Lee Engineering Co., The, Cleveland.

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Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

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Iron & Steel Products, Inc., Chicago.

CARS—Industrial and Mining
Atlas Car & Mfg. Co., The, Cleveland.
Bartlett, C. O.-Snow Co., The, Cleveland.

CASE HARDENING—See Heat Treating

CASTINGS—Acid or Heat Resisting
Ampco Metal, Inc., Milwaukee, Wis.
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.
Electro Alloys Co., Elyria, Ohio.
Hoskins Mfg. Co., Detroit, Mich.
Lebanon (Pa.) Steel Foundry.
Midvale Co., The, Nicetown Phila., Pa.
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Alloy Iron
Forging & Casting Corp., The, Ferndale, Mich.

CASTINGS—Alloy Steel
Bissett Steel Co., The, Cleveland.
Dodge Steel Co., Philadelphia, Pa.
Electro Alloys Co., Elyria, Ohio.
Hartford (Conn.) Electric Steel Corp.
Lebanon (Pa.) Steel Foundry.
Mackintosh-Hemphill Co., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.

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CASTINGS—Aluminum
Aluminum Co. of America, Pittsburgh.
Fairmount Foundry, Inc., Phila., Pa.

CASTINGS—Brass, Bronze, Copper or Aluminum
Cadman, A. W., Mfg. Co., Pittsburgh.
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Lawrenceville Bronze Co., Pittsburgh.
National Bearing Metals Corp., Pittsburgh.
Phosphor Bronze Smelting Co.,The, Phila.
Snyder, W. P., & Co., Pittsburgh.
Spencer's, I. S., Sons, Inc., Guilford, Ct.

CASTINGS—Corrosion Resisting
Electro Alloys Co., Elyria, Ohio.
Meehanite Metal Corp., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.

CASTINGS—Die, Aluminum
Aluminum Co. of America, Pittsburgh.

CASTINGS—Electric Steel
Crucible Steel Castings Co., Lansdowne, Pa.
Dodge Steel Co., Philadelphia, Pa.
Lebanon (Pa.) Steel Foundry.

CASTINGS—Gray Iron
American Engineering Co., Philadelphia.
Cheney, S., & Son, Manlius, N. Y.
Commercial Steel Casting Co., Marion, Ohio.
Fairmount Foundry, Inc., Phila., Pa.
Laconia (N. H.) Malleable Iron Co., Inc.
Lane Mfg. Co., Montpelier, Vt.
Midvale Co., The, Nicetown, Phila., Pa.
Murray Iron Wks. Co., Burlington, Iowa.
National Roll & Fdry. Co., Avonmore, Pa.
North Wales (Pa.) Mach. Co., Inc.
Spencer's, I. S., Sons, Inc., Guilford, Ct.

CASTINGS—High Test & Alloy Iron
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

CASTINGS—Malleable
Baltimore (Md.) Malleable Iron & Steel Casting Co.
Carbon Malleable Casting Co., Inc., Lancaster, Pa.
Laconia (N. H.) Malleable Iron Co., Inc.
Lake City Malleable Co., The, 5100 Lakeside Ave., Cleveland.
Malleable Iron Fittings Co., Branford, Ct.
Peoria (Ill.) Malleable Castings Co.

CASTINGS—Meehanite Metal
Meehanite Metal Corp., Pittsburgh.

CASTINGS—Monel & Nickel
Superior Bronze Corp., Erie, Pa.

CASTINGS—Semi-Steel
Malleable Iron Fittings Co., Branford, Ct.

CASTINGS—Steel
Bethlehem (Pa.) Steel Company.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Commercial Steel Casting Co., Marion, Ohio.
Crucible Steel Castings Co., Lansdowne,Pa.
Dodge Steel Co., Philadelphia, Pa.
Hartford (Conn.) Electric Steel Corp.
Lebanon (Pa.) Steel Foundry.
Mackintosh-Hemphill Co., Pittsburgh.
Malleable Iron Fittings Co., Branford, Ct.
Mesta Mch. Co., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.
Standard Steel Wks. Co., Burnham, Pa.

CASTINGS—Wear Resisting
Meehanite Metal Corp., Pittsburgh.

CEMENT—Acid-Proof
Atlas Mineral Products Co. of Pa., The, Mertztown, Pa.
Nukem Products Corp., 68 Niagara St., Buffalo, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CEMENT—Refractory
Carborundum Co., The, Perth Amboy, N. J.
Johns-Manville Corp., 22 East 40th St., New York City.
Quigley Co., Inc., 56 West 45th St., N. Y. C.

CEMENT—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.

CHAINS—Conveyor & Elevator
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Bartlett, C. O.-Snow Co., The, Cleveland.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Webster Mfg. Co., Chicago.

CHAINS—Portable
Barrett-Cravens Co., Chicago, Illinois

CHAINS—Power Transmission
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Boston Gear Works, Inc., North Quincy, Mass.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Link-Belt Co., Chicago.
Morse Chain Co., Ithaca, New York.
Ramsey Chain Co., Inc., Albany, N. Y.
Webster Mfg. Co., Chicago.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Roller
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Bartlett, C. O.-Snow Co., The, Cleveland.
Diamond Chain & Mfg. Co. Indianapolis, Ind.
Link-Belt Co., Chicago.
Morse Chain Co., Ithaca, New York.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHAINS—Silent
Link-Belt Co., Chicago.
Morse Chain Co., Ithaca, New York.
Ramsey Chain Co., Inc., Albany, N. Y.
Whitney Chain & Mfg. Co., Hartford, Ct.

CHANNELS—See Angles, Beams, Channels and Tees

CHECKS—Metal
Cunningham, M. E., Co., Pittsburgh.
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

CHEMICALS—Industrial
Du Pont de Nemours, E. I., & Co., Inc., Grasselli Chemicals Dept., Wilmington, Del.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

CHEMICALS—Rust Proofing
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.
Udylite Co., The, Detroit.

CHROMIUM METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 East 42nd St., N. Y. C.

CHUCKING MACHINES—Multiple Spindle
Baird Mch. Co., The, Bridgeport, Conn.
Goss & DeLeeuw Machine Co., New Britain, Conn.
National Acme Co., The, Cleveland.

CHUCKS—Air Operated
Hanniffin Mfg. Co., Chicago.

CHUCKS—Drill
Cleveland (Ohio) Twist Drill Co., The.
Cushman Chuck Co., Hartford, Conn.
Morse Twist Drill & Mach. Co., New Bedford, Mass.

CHUCKS—Electric
Cushman Chuck Co., Hartford, Conn.

CHUCKS—Lathe
Cushman Chuck Co., Hartford, Conn.

CHUCKS—Magnetic
Heald Mch. Co., Worcester, Mass.
Taft-Peirce Mfg. Co.,The,Woonsocket,R.I.

CIRCLES—Phosphor Bronze
Phosphor Bronze Smelting Co.,The, Phila.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

CLEANERS—Metal
American Chemical Paint Co., Ambler, Pa.
Detroit Rex Products Co., Detroit, Mich.
Ford, J. B., Co., The, Wyandotte, Mich.
Pennsylvania Salt Mfg. Co., Phila., Pa.

CLEANING COMPOUNDS—Alkali
Detroit Rex Products Co., Detroit, Mich.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

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Detroit Rex Products Co., Detroit, Mich.

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Bullard Co., The, Bridgeport, Conn.

CLOTHING—Asbestos & Fireproof
Safety Equipment Service Co., Cleveland.

CLUTCH-BRAKES—Magnetic
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

CLUTCHES
Fairbanks, Morse & Co., Chicago.
Falls Clutch & Mchry. Co., The, Cuyahoga Falls, Ohio.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Medart Co., The, St. Louis, Mo.
Morse Chain Co., Ithaca, New York.

CLUTCHES—Magnetic
Cutler-Hammer, Inc., Milwaukee.
Dings Magnetic Separator Co., Milwaukee.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

COAL
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Koppers Coal Co., Inc., The, Pittsburgh.
Pickands Mather & Co., Cleveland.

COAL, ORE AND ASH HANDLING MACHINERY
Bartlett, C. O.-Snow Co., The, Cleveland.
Robins Conveying Belt Co., 15 Park Row, N. Y. C.
Webster Mfg. Co., Chicago.

COBALT METAL
Central Trading Corp., 511 Fifth Ave., N. Y. C.

COILS—Lead
National Lead Co., 111 Bdway., N. Y. C.

COILS—Pipe
Harrisburg (Pa.) Steel Corp.

COKE—Metallurgical
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Pickands Mather & Co., Cleveland.

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., The, Cleveland.
Koppers Co., Pittsburgh.

COKE OVENS—By-Products
Koppers Co., Pittsburgh.

COKE OVENS—Cross Regenerators
Koppers Co., Pittsburgh.

COKE OVENS—With Recovery of By-Products
Koppers Co., Pittsburgh.

COLLETS
Rivett Lathe & Grinder, Inc., Boston, Mass.

COLUMBIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

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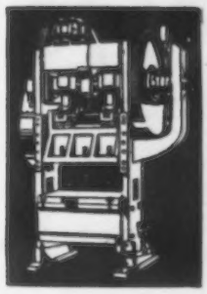

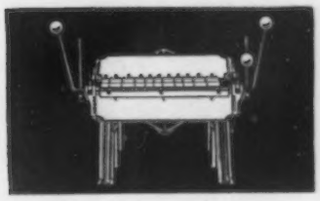

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Brown Instrument Co., The, Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia.
Morgan Construction Co., Worcester, Mass.
North American Mfg. Co., The, Cleveland.

COMPOUNDS—Drawing
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

COMPRESSORS—Air
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Fairbanks, Morse & Co., Chicago.
Ingersoll-Rand Co., 11 Broadway, New York City.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Spencer Turbine Co., Hartford, Conn.
Sullivan Machinery Co., Michigan City, Ind.
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Gas
Sullivan Machinery Co., Michigan City, Ind.
Worthington Pump & Machinery Corp., Harrison, N. J.

COMPRESSORS—Rebuilt. (See Clearing House Section)

CONCRETE CONSTRUCTION
Ferguson, H. K., Co., The, Cleveland.

CONDENSERS—Surface & Jet
Ingersoll-Rand Co., 11 Broadway, N.Y.C.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Worthington Pump & Machinery Corp., Harrison, N. J.

CONDUITS—Flexible Metallic
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

CONTRACTORS' SUPPLIES — Second-Hand. (See Clearing House Section)

CONTROL SYSTEMS—Temperature
Leeds & Northrup Co., Philadelphia.

CONTROLLERS—Crane
Cutler-Hammer, Inc., Milwaukee.

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Electric Controller & Mfg. Co., The, Cleveland.
General Electric Co., Schenectady, N. Y.

CONTROLLERS—Valve, Electrically Operated
Brown Instrument Co., The, Philadelphia, Pa.
Cutler-Hammer, Inc., Milwaukee.
Leeds & Northrup Co., Philadelphia.

CONVEYING AND ELEVATING MACHINERY
Bartlett, C. O.-Snow Co., The, Cleveland.
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Logan Co., Inc., Louisville, Ky.
Mathews Conveyer Co., Ellwood City, Pa.
Robins Conveying Belt Co., 15 Park Row, N. Y. C.

CONVEYOR WORMS
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.

CONVEYORS—Gravity
Logan Co., Inc., Louisville, Ky.
Mathews Conveyer Co., Ellwood City, Pa.

CONVEYORS—Monorail
American Monorail Co., The, Cleveland.
Cleveland Tramrail Div. of The Cleveland Crane & Engng. Co., Wickliffe, Ohio.

CONVEYORS—Portable
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Robins Conveying Belt Co., 15 Park Row, N. Y. C.

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Schatz Mfg. Co., The, Poughkeepsie, N. Y.

CORE OIL
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

CORUNDUM WHEELS — See Grinding Wheels

COTTERS AND KEYS—Spring
Hindley Mfg. Co., Valley Falls, R. I.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lamson & Sessions Co., The, Cleveland.
Western Wire Prods. Co., St. Louis, Mo.

COUNTERBORES
Cleveland (Ohio) Twist Drill Co., The.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

COUNTERS—Production
Durant Mfg. Co., Milwaukee, Wis.
Veeder-Root, Inc., Hartford, Ct.

COUNTERS—Revolution, Recording
Durant Mfg. Co., Milwaukee, Wis.

COUNTING MACHINES
Veeder-Root, Inc., Hartford, Conn.

COUPLINGS—Air Hose
Cleveland (Ohio) Pneumatic Tool Co., The.

COUPLINGS—Cut-off Friction
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.

COUPLINGS—Flexible
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Lovejoy Flexible Coupling Co., Chicago.
Morse Chain Co., Ithaca, New York.
Poole Foundry & Mch. Co., Baltimore, Md.
Ramsey Chain Co., Inc., Albany, N. Y.
Waldron, John, Corp., New Brunswick, N. J.

COUPLINGS—Pipe
Harrisburg (Pa.) Steel Corp.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

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Browning Crane & Shovel Co., Cleveland.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Industrial Brownhoist Corp., Bay City, Mich.
Ohio Locomotive Crane Co., The, Bucyrus, Ohio.

CRANES — Electric, Industrial, Truck Mounted
Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Browning Crane & Shovel Co., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANES—Electric Traveling
Armel, James P., Pittsburgh.
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Conco Engineering Works, Mendota, Ill.
Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
Electric Hoist & Motor Co., 149 N. 9th St., Bklyn., N. Y.
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Northern Engineering Works, Detroit, Mich.
Robbins & Myers, Inc., Springfield, Ohio.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
Whiting Corp., Harvey, Ill.

CRANES—Gantry
Browning Crane & Shovel Co., Cleveland.
Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Morgan Engineering Co., The, Alliance, O.
Whiting Corp., Harvey, Ill.

CRANES—Hand Power
American Monorail Co., The, Cleveland.
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CRANES—Locomotive
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CRANES—Monorail
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Baker-Raulang Co., The, 2175 W. 25th St., Cleveland.
Elwell-Parker Electric Co., The, Cleveland.

CRANKSHAFTS
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Union Drawn Steel Co., Massillon, Ohio.

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Bay City Forge Co., Erie, Pa.

CRUSHERS—Coal
American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

CRUSHERS—Steel Turning
American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.

CUTTERS—Die Sinking
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Tomkins-Johnson Co., The, Jackson, Mich.

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Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

CUTTING-OFF MACHINES—Abrasives
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Espen-Lucas Mch. Wks., Philadelphia.

CUTTING-OFF MACHINES—Pipe or Tubing
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Bardons & Oliver, Cleveland.
Landis Mch. Co., Inc., Waynesboro, Pa.

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CYLINDERS — Compressed Air & Hydraulic
Hanna Engineering Works, 1761 Elston Ave., Chicago.
Tomkins-Johnson Co., The, Jackson, Mich.

CYLINDERS—Seamless
Harrisburg (Pa.) Steel Corp.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

DEGREASING COMPOUNDS
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

DEGREASING MACHINES—Solvent
Detroit Rex Products Co., Detroit, Mich.

DEOXIDIZERS
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.

DICTATING MACHINES
Dictaphone Sales Corp., 420 Lexington Ave., New York City.

DIE-FILING MACHINES
Continental Machine Specialties, Inc., Minneapolis, Minn.

DIE SETS
U. S. Tool Co., Inc., Ampere, N. J.

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Henry & Wright Mfg. Co., The, Hartford, Conn.

DIES—Cast Tool Steel
Forging & Casting Corp., The, Ferndale, Mich.

DIES, JIGS, FIXTURES, etc.
Atlantic Mfg. Co., Philadelphia.
Taft-Peirce Mfg. Co.,The,Woonsocket,R. I.

DIES—Pipe Threading
Landis Mch. Co., Inc., Waynesboro, Pa.
Murchey Machine & Tool Co., Detroit.

DIES—Screw and Thread Cutting
Eastern Mach. Screw Corp., New Haven, Ct.
Greenfield (Mass.) Tap & Die Corp.
Jones & Lamson Mch. Co., Springfield, Vt.
Landis Mch. Co., Inc., Waynesboro, Pa.
Murchey Machine & Tool Co., Detroit.

DIES—Self-Opening Adjustable
Eastern Mach. Screw Corp., New Haven, Ct.
Jones & Lamson Mch. Co., Springfield, Vt.
Landis Mch. Co., Inc., Waynesboro, Pa.
Murchey Machine & Tool Co., Detroit.
National Acme Co., The, Cleveland.

DIES—Sheet Metal Working
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DIES—Steel Letters and Stamps
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Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

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Huot Mfg. Co., 500 Robert St., St. Paul, Minn.

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DRILLING MACHINES—Portable Electric
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Wodack Electric Tool Corp., Chicago.

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Cincinnati (Ohio) Bickford Tool Co., The.

DRILLING MACHINES—Sensitive
Leland-Gifford Co., Worcester, Mass.

DRILLING MACHINES—Upright
Baker Bros., Inc., Toledo, Ohio.
Cincinnati (Ohio) Bickford Tool Co., The.

DRILLING MACHINES—Vertical
Baker Bros., Inc., Toledo, Ohio.
Cincinnati (Ohio) Bickford Tool Co., The.

DRIVES—Gear
Farrel-Birmingham Co., Inc.,Buffalo,N.Y.
Mesta Mch. Co., Pittsburgh.

DRIVES—Single & Multiple V-Belts
Allis Chalmers Mfg. Co., Milwaukee.

DROP FORGINGS—See Forgings—Drop, Iron or Steel

DROP HAMMERS—See Hammers—Drop

DUST COLLECTORS
Abrasive Machine Tool Co., East Providence, R. I.
American Air Filter Co., Inc., Louisville, Ky.
American Blower Corp., 6000 Russell St., Detroit.
American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.
Blaw-Knox Co., Pittsburgh.
Pangborn Corporation, Hagerstown, Md.
Whiting Corp., Harvey, Ill.

ECONOMIZERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

ELECTRIC HEATING ELEMENTS
Globar Div., The Carborundum Co., Niagara Falls, N. Y.

ELECTRIC LIGHTING—Industrial
General Electric Co., Cleveland.
General Electric Vapor Lamp Co., Hoboken, N. J.

ELECTRIC WELDING — See Welding — Electric

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee.
General Electric Co., Schenectady, N. Y.

ELECTRICAL MACHINERY — Second Hand. (See Clearing House Section)

ELECTRICAL WIRES
Roebling's, John A., Sons Co., Trenton, N. J.

ELECTRODE HOLDERS—Welding
Lincoln Electric Co., The, Cleveland.

ELECTRODES—Resistance Welding
Electroloy Co., Inc., 50 Church St., New York City.

ELECTRODES—Welding, Coated
Electric Arc Cutting & Welding Co., The, Newark, N. J.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Lincoln Electric Co., The, Cleveland.
Maurath, Inc., 7400 Union Ave., Cleveland.
Una Welding, Inc., Cleveland, Ohio.

ELECTROPLATING EQUIPMENT & SUPPLIES
Udylite Co., The, Detroit.

ELEVATORS—Portable
Barrett-Cravens Co., Chicago, Ill.
Lewis-Shepard Co., 122 Walnut St., Watertown Station, Boston.

ELEVATORS—Steam Hydraulic
Ridgway, Craig, & Son Co., Coatesville, Pa.

EMERY WHEELS—See Grinding Wheels

ENGINEERS & CONTRACTORS
Ferguson, H. K., Co., The, Cleveland.

ENGINEERS—Consulting and Industrial
Koppers Co., Pittsburgh.

ENGINES—Diesel
Ingersoll-Rand Co., 11 Broadway, N. Y. C.
Worthington Pump & Machinery Corp., Harrison, N. J.

ENGINES—Gas
Fairbanks, Morse & Co., Chicago.
Worthington Pump & Machinery Corp., Harrison, N. J.

ENGINES—Oil
Worthington Pump & Machinery Corp., Harrison, N. J.

EYELET MACHINES
Manville, E. J., Mch. Co., Waterbury, Ct.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

FACING CLAY
Carborundum Co., The, Perth Amboy, N.J.

FACTORY & PLANT SITES
Zoll, Edward H., 196 Market St., Newark, N. J.

FANS—Ventilating
American Blower Corp., 6000 Russell St., Detroit.
DeVilbiss Co., The, Toledo, Ohio.

FEED WATER HEATERS AND PURIFIERS
Harrisburg (Pa.) Steel Corp.

FEEDS—Hydraulic, for Machines
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Oilgear Co., The, 1311 W. Bruce St., Milwaukee.

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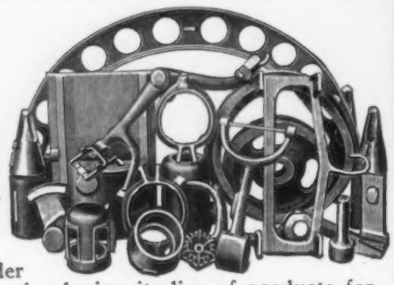

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Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
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Pittsburgh Metallurgical Co., Inc., Niagara Falls, N. Y.
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., N. Y. C.
FERROCHROME
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.
Ohio Ferro-Alloys Corp., Canton, Ohio.
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FIXTURES—For Machine Tools
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Standard Steel Wks. Co., Burnham, Pa.
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FLEXIBLE SHAFT EQUIPMENT
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National Forge & Ordnance Co., Irvine, Pa.
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Aluminum Co. of America, Pittsburgh.
FORGINGS—Brass, Bronze or Copper
American Brass Co., The, Waterbury, Conn.
Commonwealth Brass Corp., Detroit.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.
Transue & Williams Steel Forging Corp., Alliance, Ohio.
FORGINGS—Coin Pressed
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FORGINGS—Drop, Iron or Steel
Atlas Drop Forge Co., Lansing, Mich.
Bay City Forge Co., Erie, P.
Billings & Spencer Co., Hartford, Conn.
Canton (Ohio) Drop Forging & Mfg. Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Forging & Casting Corp., The, Ferndale, Mich.
Poor & Co., Canton Forge & Axle Wks., Canton, Ohio
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Storms Drop Forging Co., Springfield, Mass.
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Atlas Drop Forge Co., Lansing, Mich.
Bethlehem (Pa.) Steel Company.
Mesta Mch. Co., Pittsburgh.
Midvale Co., The, Nicetown, Phila., Pa.
National Forge & Ordnance Co., Irvine, Pa.
Standard Steel Wks. Co., Burnham, Pa.
FORGINGS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.
FORGINGS—Upset
Bethlehem (Pa.) Steel Company.
Lamson & Sessions Co., The, Cleveland.
Rockford (Ill.) Drop Forge Co.
FORMING AND COILING MACHINES
Peck, Stow & Wilcox Co., The, Southington, Conn.
FOUNDRY EQUIPMENT & SUPPLIES
Whiting Corp., Harvey, Ill.
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Electric Furnace Co., The, Salem, Ohio.
Flinn & Dreffein Co., Chicago.
Surface Combustion Corp., 2375 Dorr St., Toledo.
Wilson, Lee Engineering Co., The, Cleveland.
FURNACES—Annealing & Case Hardening
American Gas Furnace Co., Elizabeth, N. J.
Electric Furnace Co., The, Salem, Ohio.
Leeds & Northrup Co., Philadelphia.
Surface Combustion Corp., 2375 Dorr St., Toledo.
Wilson, Lee Engineering Co., The, Cleveland.
FURNACES—Billet or Ingot Heating
Flinn & Dreffein Co., Chicago.
Surface Combustion Corp., 2375 Dorr St., Toledo.
FURNACES—Brass Melting
Monarch Engineering & Mfg. Co., The, Baltimore, Md.
FURNACES—Electric, Steel Melting
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
General Electric Co., Schenectady, N. Y.
Pittsburgh (Pa.) Lectromelt Furnace Corp.
FURNACES—Enameling
Carborundum Co., The, Perth Amboy, N. J.
Electric Furnace Co., The, Salem, Ohio.
Surface Combustion Corp., 2375 Dorr St., Toledo.
FURNACES—Forging
Electric Furnace Co., The, Salem, Ohio.
Holcroft & Co., Detroit.
Surface Combustion Corp., 2375 Dorr St., Toledo.
Wilson, Lee Engineering Co., The, Cleveland.
FURNACES—Heat Treating, Automatic
Amer. Gas Furnace Co., Elizabeth, N. J.
Electric Furnace Co., The, Salem, Ohio.
Holcroft & Co., Detroit.
Leeds & Northrup Co., Philadelphia.
Rockwell, W. S., Co., 50 Church St., N. Y. C.
Surface Combustion Corp., 2375 Dorr St., Toledo.
FURNACES—Heat Treating, Cyanide or Lead
Chicago (Ill.) Flexible Shaft Co.
Electric Furnace Co., The, Salem, Ohio.
Surface Combustion Corp., 2375 Dorr St., Toledo.
FURNACES—Heat Treating, Electric
Electric Furnace Co., The, Salem, Ohio.
General Electric Co., Schenectady, N. Y.
Holcroft & Co., Detroit.

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Hoskins Mfg. Co., Detroit, Mich.
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Maehler, Paul Co., The, Chicago.
Rockwell, W. S., Co., 50 Church St., N.Y.C.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

FURNACES—Heat Treating, Oil or Gas
Chicago (Ill.) Flexible Shaft Co.
Electric Furnace Co., The, Salem, Ohio.
Holcroft & Co., Detroit.
Maehler, Paul Co., The, Chicago.
Monarch Engineering & Mfg. Co., The, Baltimore, Md.
Rockwell, W. S., Co., 50 Church St., N.Y.C.
Surface Combustion Corp., 2375 Dorr St., Toledo.
Wilson, Lee Engineering Co., The, Cleveland.

FURNACES—Pack Heating Sheets
Aetna-Standard Engineering Co., The Youngstown, Ohio.
Wean Engineering Co., Inc., The, Warren, Ohio.

FURNACES—Rivet Heating, Electric
General Electric Co., Schenectady, N. Y.

FURNACES—Wire, Annealing and Galvanizing
General Electric Co., Schenectady, N. Y.
Surface Combustion Corp., 2375 Dorr St., Toledo.

GAGE BLOCKS
Ford Motor Co. (Johansson Division), Dearborn, Mich.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

GAGES—Dial
Starrett, L. S., Co., Athol, Mass.

GAGES—Electric
Sheffield Gage Corp., Dayton, Ohio.

GAGES—Plug and Snap
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Sheffield Gage Corp., Dayton, Ohio.
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.

GAGES—Pressure & Vacuum Recording
Brown Instrument Co., The, Philadelphia, Pa.

GAGES—Temperature
Weston Electrical Instrument Corp., Newark, N. J.

GAGES—Thickness, for Rolling Mills
Haines Gauge Co., The, Phila., Pa.

GAGES—Thread Lead
Jones & Lamson Mch. Co., Springfield, Vt.
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
Sheffield Gage Corp., Dayton, Ohio.

GALVANIZING
Castle, Joseph P., & Bros., Phila.

GALVANIZING COMPOUNDS
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

GALVANIZING PLANTS—For Sheets
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Erie (Pa.) Foundry Co.

GAS ANALYSIS RECORDERS
Brown Instrument Co., The, Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia.

GAS FOR INDUSTRIAL USES
American Gas Association, 420 Lexington Ave., N. Y. C.

GAS PRODUCERS
Flinn & Dreffein Co., Chicago.
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Morgan Construction Co., Worcester, Mass.
Wood, R. D., & Co., Philadelphia.

GAS RECOVERY COKE OVENS
Koppers Co., Pittsburgh.

GASKETS—Asbestos, Metal or Rubber
Garlock Packing Co., The, Palmyra, N. Y.
Johns-Manville Corp., 22 East 40th St., New York City.

GASKETS—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.

GEAR CUTTING
Earle Gear & Machine Co., Phila.
Farrel-Birmingham Co., Inc., Buffalo, N.Y.
Gleason Works, Rochester, N. Y.
James, D. O., Mfg. Co., Chicago.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Philadelphia (Pa.) Gear Works.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

GEAR CUTTING MACHINES
Farrel-Birmingham Co., Inc., Buffalo, N.Y.
Gleason Works, Rochester, N. Y.

GEAR DRIVES—Herringbone
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Lewis Foundry & Mch. Co., Pittsburgh.
United Engineering & Fdry. Co., Pgh.

GEARMOTORS
Allis-Chalmers Mfg. Co., Milwaukee.
James, D. O., Mfg. Co., Chicago.
Reliance Electric & Engng. Co., Cleveland.
Westinghouse Elec. & Mfg. Co., East Pgh.

GEAR PLANNING MACHINES
Gleason Works, Rochester, N. Y.

GEARS—Bevel
Boston Gear Wks., Inc., North Quincy, Mass.
Gleason Works, Rochester, N. Y.
James, D. O., Mfg. Co., Chicago.
Richardson Co., The, Melrose Park, Ill.

GEARS—Heat Treated
Gleason Works, Rochester, N. Y.
James, D. O., Mfg. Co., Chicago.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Simonds Mfg. Co., Pittsburgh.

GEARS—Herringbone
Farrel-Birmingham Co., Inc., Buffalo, N.Y.
Horsburgh & Scott Co., 5112 Hamilton Ave., Cleveland.
James, D. O., Mfg. Co., Chicago.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Mesta Mch. Co., Pittsburgh.
Philadelphia (Pa.) Gear Works.

GEARS—Machine Cut
Boston Gear Wks., Inc., North Quincy, Mass.
Cleveland (Ohio) Worm & Gear Co.
Gleason Works, Rochester, N. Y.
James, D. O., Mfg. Co., Chicago.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Simonds Mfg. Co., Pittsburgh.

GEARS—Machine Molded
Poole Foundry & Mch. Co., Baltimore, Md.

GEARS—Non-Metallic
Boston Gear Wks., Inc., North Quincy, Mass.
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.
General Electric Co., Schenectady, N. Y.
James, D. O., Mfg. Co., Chicago.

GEARS—Rawhide
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

GEARS—Steel, Silent
Waldron, John, Corp., New Brunswick, N. J.

GEARS—Spur
Boston Gear Wks., Inc., North Quincy, Mass.
James, D. O., Mfg. Co., Chicago.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Philadelphia (Pa.) Gear Works.
Simonds Mfg. Co., Pittsburgh.

GEARS—Worm
Boston Gear Wks., Inc., North Quincy, Mass.
Cleveland (Ohio) Worm & Gear Co.
Horsburgh & Scott Co., 5112 Hamilton Ave., Cleveland.
James, D. O., Mfg. Co., Chicago.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.
Philadelphia (Pa.) Gear Works.

GENERATORS—Acetylene
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

GENERATORS—Electric
Fairbanks, Morse & Co., Chicago.
Lincoln Electric Co., The, Cleveland.
Reliance Electric & Engng. Co., Cleveland.
Westinghouse Elec. & Mfg. Co., East Pgh.

GENERATORS—Electric, Second Hand. (See Clearing House Section)

GLOVES—Asbestos & Fireproof
Safety Equipment Service Co., Cleveland.

GOGGLES—Safety
American Optical Co., Southbridge, Mass.
Safety Equipment Service Co., Cleveland.

GOVERNORS—Air Compressor
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

GRABS—For Sheets and Coils
J-B Engineering Sales Co., 1738 Orange St., New Haven, Conn.

GRATING—Flooring, Sidewalk, etc.—See Flooring—Open Steel

GREASE—Lubricating
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

GRILLES—Metal Cane
Diamond Mfg. Co., Wyoming, Pa.

GRILLES—Perforated Metal
Erdle Perforating Co., Rochester, N. Y.
Harrington & King Perforated Co., Chicago.

GRINDING AND POLISHING MACHINES
Black & Decker Mfg. Co., The, Towson, Md.
Excelsior Tool & Mch. Co., E. St. Louis, Ill.
Norton Co., Worcester, Mass.
Production Machine Co., Greenfield, Mass.

GRINDING MACHINES—Belt
Production Machine Co., Greenfield, Mass.

GRINDING MACHINES—Broach
Thompson Grinder Co., Springfield, Ohio.

GRINDING MACHINES—Centerless
Cincinnati (Ohio) Grinders Incorporated.

GRINDING MACHINES—Cutter & Reamer
Cincinnati (Ohio) Milling Mch. Co., The.
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Brown & Sharpe Mfg. Co., Providence, R.I.
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Landis Tool Co., Waynesboro, Pa.
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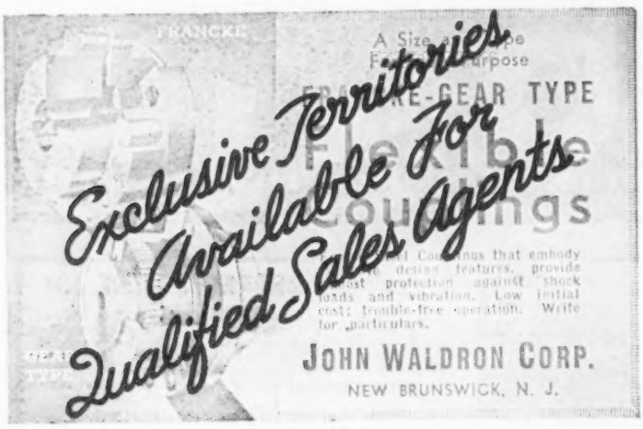

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Macklin Co., Jackson, Mich.
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Central Iron & Steel Co., Harrisburg, Pa.

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Holden, A. F., Co., New Haven, Conn.

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General Machine Wks., York, Pa.
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.
Holden, A. F., Co., New Haven, Conn.
Parish Pressed Steel Co., Reading, Pa.

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Curtis Pneumatic Machinery Co., 1948 Kienlen Ave., St. Louis, Mo.
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Hanna Engineering Works, 1761 Elston Ave., Chicago.
Ingersoll-Rand Co., 11 Broadway, N. Y. C.
Northern Engineering Works, Detroit.
Ridgway, Craig & Son Co., Coatesville, Pa.

HOISTS—Chain
Wright Mfg. Div., American Chain & Cable Co., Inc., York, Pa.
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

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American Engineering Co., Philadelphia.
Detroit (Mich.) Hoist & Mach. Co.
Euclid Crane & Hoist Co., The, Euclid, O.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee, Wis.
Maris Brothers, Inc., Philadelphia.
Northern Engineering Works, Detroit, Mich.
Philadelphia (Pa.) Gear Works.
Robbins & Myers, Inc., Springfield, Ohio.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.
Wright Mfg. Div., American Chain & Cable Co., Inc., York, Pa.
Yale & Towne Mfg. Co., The, Phila. Div., Phila., Pa.

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Euclid Crane & Hoist Co., The, Euclid, O.
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Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.

HOISTS—Monorail
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Euclid Crane & Hoist Co., The, Euclid, O.
Northern Engineering Works, Detroit.
Shaw-Box Crane & Hoist Div. Manning, Maxwell & Moore, Inc., 402 Broadway, Muskegon, Mich.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

HOISTS—Scraper
Sullivan Machinery Co., Claremont, N. H.

HOSE—Air, Oil, Steam and Water
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

HOSE—Flexible Metallic
American Brass Co., The, Waterbury, Conn.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia.

HOSE—Rubber
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Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

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Chambersburg (Pa.) Engineering Co.
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Farquhar, A. B., Co., Ltd., York, Pa.
Hydraulik Gmbh. Duisburg, Germany.
Lake Erie Engineering Corp., 68 Kenmore Sts., Buffalo, N. Y.
Morgan Engineering Co., The, Alliance, O.
Wood, R. D., & Co., Philadelphia.

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Shenango-Penn Mold Co., Pittsburgh.
Snyder, W. P., & Co., Pittsburgh.
Valley Mould & Iron Corp., Hubbard, Ohio.

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Du Pont de Nemours, E. I., & Co., Inc. Grasselli Chemicals Dept., Wilmington, Del.

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INSTRUMENTS—Recording
Brown Instfument Co., The, Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia.

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Johns-Manville Corp., 22 East 40th St., New York City.

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Ludlum Steel Co., Watervliet, N. Y.

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Western Wire Prods. Co., St. Louis, Mo.

KEYSEATING MACHINES
Baker Bros., Inc., Toledo, Ohio.
Davis Keyseater Co., 460 Exchange St., Rochester, N. Y.

LACING—Belt, Rawhide or Leather
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

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Quigley Co., Inc., 56 West 45th St., N. Y. C.

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General Electric Co., Cleveland.

LAMPS—Mercury Vapor
General Electric Vapor Lamp Co., Hoboken, N. J.

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Cincinnati (Ohio) Grinders Incorporated.

LATHES—Automatic
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Goss & De Leeuw Mch. Co., New Britain, Conn.
Jones & Lamson Mch. Co., Springfield, Vt.
LeBlond, R. K., Mch. Tool Co., Cincinnatti.
Monarch Mch. Tool Co., The, Sidney, O.

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Bullard Co., The, Bridgeport, Conn.
Gisholt Machine Co., Madison, Wis.

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South Bend (Ind.) Lathe Works, 595 East Madison St.

LATHES—Brass
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LATHES—Chucking
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Warner & Swasey Co., The, Cleveland.

LATHES—Contour Turning
Monarch Mch. Tool Co., The, Sidney, O.

LATHES—Crankshaft
LeBlond, R. K., Mch. Tool Co., Cincinnati.

LATHES—Engine
Hill-Clarke Mchry. Co., 647 W. Washington Blvd., Chicago.
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Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.
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Rogers Machine Wks., Alfred, New York.

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LEAD—Tellurium
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Davenport (Iowa) Locomotives Works.
General Electric Co., Schenectady, N. Y.

LOCOMOTIVES—Gas-Electric
Davenport (Iowa) Locomotives Works.

LOCOMOTIVES—Industrial
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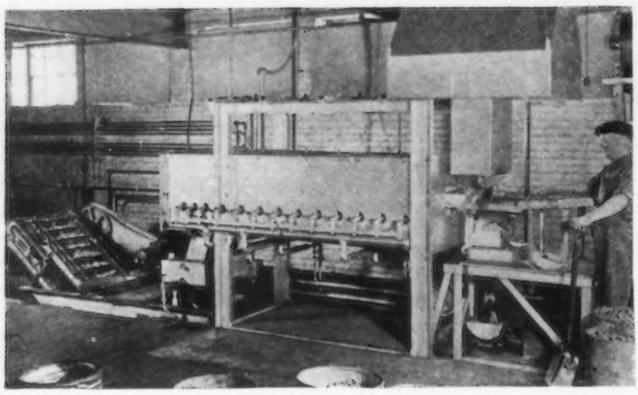

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Carborundum Co., The, Perth Amboy, N. J.

MAGNESIUM
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

MAGNETS—Lifting
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Electric Controller & Mfg. Co., The, Cleve.
Ohio Electric Mfg. Co., The, 5908 Maurice Ave., Cleveland.

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Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

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Nicholson, W. H., & Co., 165 Oregon St., Wilkes-Barre, Pa.

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Worth Steel Co., Claymont, Del.

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Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

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Noble & Westbrook Mfg. Co., The, East Hartford, Conn.

METAL SPECIALTIES
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Toledo (Ohio) Stamping & Mfg. Co.
Torrington (Conn.) Company.
Truscon Steel Co., Pressed Steel Div., Cleveland.
Whitehead Stamping Co., 1669 W. Lafayette Blvd., Detroit, Mich.
Worcester (Mass.) Stamped Metal Co.

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Chace, W. M., Co., 1605 Beard Ave., Detroit.

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Metals Coating Co. of America, Phila., Pa.

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Leeds & Northrup Co., Philadelphia.

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MICA SCHIST
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Cincinnati (Ohio) Planer Co.

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Tabor Mfg. Co., Phila., Pa.

MOLYBDENUM
Climax Molybdenum Co., 500 Fifth Ave., N. Y. C.

MONEL METAL
International Nickel Co., Inc., The, 67 Wall St., N. Y. C.

MONORAIL SYSTEMS—Hand & Electric
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Fairbanks, Morse & Co., Chicago.
General Electric Co., Schenectady, N. Y.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Lincoln Electric Co., Cleveland.
Reliance Electric & Engineering Co., Cleveland.
Westinghouse Elec. & Mfg. Co., E. Pgh.

MOTORS—Electric, Second-Hand. (See Clearing House Section)

MUFFLES—Alloy
Electro Alloys Co., Elyria, Ohio.

NAILS—Wire
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Hassall, John, Inc., Clay & Oakland Sts., Bklyn., N. Y.
Pittsburgh (Pa.) Steel Co.
Wickwire Brothers, Cortland, N. Y.
Youngstown (Ohio) Sheet & Tube Co., The.

NIBBLING MACHINES
Gray Machine Co., Philadelphia.

NICKEL
International Nickel Co., Inc., The, 67 Wall St., N. Y. C.

NICKEL ANODES—Rolled or Cast
Seymour (Conn.) Mfg. Co.

NICKEL SILVER
Seymour (Conn.) Mfg. Co.

NITROGEN
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.

NOZZLES—Sand Blasting
Norton Co., Worcester, Mass.

NUMBERING MACHINES—For Metal
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

NUT MACHINERY — Automatic Cold Pressed
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

NUTS—Acorn
Republic Steel Corp., Upson Nut Div., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Castellated
National Acme Co., The, Cleveland.
Republic Steel Corp., Upson Nut Div., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Cold Punched
Republic Steel Corp., Upson Nut Div., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Hot Pressed
Republic Steel Corp., Upson Nut Div., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Lock
Standard Pressed Steel Co., Jenkintown, Pa.

NUTS—Machine Screw
Blake & Johnson Co., The, Waterville, Ct.

NUTS—Semi-Finished
Cleveland (Ohio) Cap Screw Co., The.
Republic Steel Corp., Upson Nut Div., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Thumb Malleable
Republic Steel Corp., Upson Nut Div., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

NUTS—Wing
Parker-Kalon Corp., 196 Varick St., N. Y. C.

OIL & GREASE SEALS
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

OIL RETAINERS
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

OIL STONES
Carborundum Co., The, Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

OILS—Cutting
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago, Ill.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Fuel
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago, Ill.
Sun Oil Co., Philadelphia.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Lubricating
Gulf Oil Corp., Gulf Refining Co., Pittsburgh.
Shell's Industrial Lubricants Div., Shell Bldg., San Francisco, Shell Bldg., St. Louis, & 50 W. 50th St., N. Y. C.
Socony-Vacuum Oil Co., Inc., 26 Broadway, N. Y. C.
Standard Oil Co. (Indiana), Chicago.
Texas Company, The, 135 East 42nd St., N. Y. C.
Tide Water Associated Oil Co., 17 Battery Place, N. Y. C.

OILS—Soluble—See Oils—Cutting

ORES—Iron
Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Pickands Mather & Co., Cleveland.
Shenango Furnace Co., Pittsburgh.
Snyder, W. P., & Co., Pittsburgh.

OVENS—Coke and By-Product Recovery
Koppers Co., Pittsburgh.

OVENS—Core and Mold
Herrington & Randall, Inc., Detroit.
Holcroft & Co., Detroit.
Monarch Engineering & Mfg. Co., The, Baltimore, Md.

OVENS—Cross Regenerative
Koppers Co., Pittsburgh.

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Herrington & Randall, Inc., Detroit.
Maehler, Paul Co., The, Chicago.
Surface Combustion Corp., 2375 Dorr St., Toledo.

OXY-ACETYLENE — Shape-Cutting Machines
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

OXYGEN
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.

PACKING—Felt
American Felt Co., 315 Fourth Ave., N. Y. C.

PACKING—Hydraulic
Rhoads, J. E. & Sons, Philadelphia.

PACKING—Leather
Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.
Rhoads, J. E., & Sons, Philadelphia.

PACKING—Metallic
Garlock Packing Co., The, Palmyra, N. Y.

PACKING—Rubber
Goodrich, B. F., Co., The, Akron, Ohio.
Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

PACKING—Sheet, Asbestos or Rubber
Garlock Packing Co., The, Palmyra, N. Y.
Johns-Manville Corp., 22 East 40th St., New York City.

PAINT
Midland Paint & Varnish Co., The, Cleveland.
National Lead Co., 111 Bdway., N. Y. C.

PAINT STICKS
Helmer & Staley, Inc., Chicago, Ill.

PERFORATED METAL
Chicago Perforating Co., 2440 W 24th Place, Chicago, Ill.
Diamond Mfg. Co., Wyoming, Pa.
Erdle Perforating Co., Rochester, N. Y.
Harrington & King Perforating Co., Chicago.
Hendrick Mfg. Co., Carbondale, Pa.
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

PHOSPHOR—Copper
Phosphor Bronze Smelting Co., The, Phila.

PICKLING COMPOUNDS
American Chemical Paint Co., Ambler, Pa.

PICKLING MACHINES
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Mesta Mch. Co., Pittsburgh.

PICKLING TANK LININGS
Ceilcote Co., The, Cleveland.
Keagler Brick Co., Steubenville, Ohio.
National Lead Co., 111 Bdway., N. Y. C.

PICKLING TANK STEAM JETS
Dietzel Lead Burning Co., Pittsburgh.
Durion Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

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Brooke, E. & G., Iron Co., Birdsboro, Pa.
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Cleveland-Cliffs Iron Co., The, Cleveland, Ohio.
Hanna Furnace Corp., The, Detroit, Mich.
Pickands Mather & Co., Cleveland.
Republic Steel Corp., Cleveland, Ohio.
Shenango Furnace Co., Pittsburgh.
Shenango-Penn Mold Co., Pittsburgh.
Superior Charcoal Iron Co., Grand Rapids, Mich.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

PIG IRON—Charcoal
Superior Charcoal Iron Co., Grand Rapids, Mich.

PILING—Steel Pipe
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

PILING—Steel Sheet
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.

PINIONS—Rolling Mill
Mesta Mch. Co., Pittsburgh.

PINIONS—Wire and Rod
Rathbone, A. R. & J., Palmer, Mass.

PINS—Cotter
Lamson & Sessions Co., The, Cleveland.

PIPE—Acid Resisting
Haveg Corporation, Newark, Delaware.

PIPE—Cast Iron, B. & S. and Flanged
Wood, R. D., & Co., Philadelphia.

PIPE—Hammer Welded
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

PIPE—Lead
National Lead Co., 111 Bdway., N. Y. C.

PIPE—Lead Lined
National Lead Co., 111 Bdway., N. Y. C.

PIPE—New and Second-Hand
Albert & Davidson Pipe Corp., 2nd Ave., 50-51st St., Bklyn., N. Y.
Albert Pipe Supply Co., Inc., Berry and N. 13th St., Bklyn., N. Y.
Greenpoint Iron & Pipe Co., Inc., Stagg & Bogart Sts., Bklyn., N. Y.

PIPE—Seamless Brass or Copper
American Brass Co., The, Waterbury, Conn.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

PIPE—Spiral Welded
American Rolling Mill Co., Middletown, O.
Crane Co., Chicago.

PIPE—Standard, Black and Galvanized
Bethlehem (Pa.) Steel Co.
Jones & Laughlin Steel Corp., Pittsburgh.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Republic Steel Corp., Cleveland, Ohio.
Youngstown (Ohio) Sheet & Tube Co., The.

PIPE—Welded, Electric
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Republic Steel Corp., Cleveland, Ohio.

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Johns-Manville Corp., 22 East 40th St., New York City.

PIPE FITTINGS
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PIPE THREADING & CUTTING MACHINES
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Jarecki Mfg. Co., Erie, Pa.
Landis, Mach. Co., Inc., Waynesboro, Pa.
Merrell Mfg. Co., Toledo.
Murchey Machine & Tool Co., Detroit.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

PLANERS
Cincinnati (Ohio) Planer Co.

PLANING MACHINES — Second Hand. (See Clearing House Section)

PLASTICS—Laminated
Bakelite Corp., 247 Park Ave., N. Y. C.

PLASTICS — Laminated or Molded Phenolic
Richardson Co., The, Melrose Park, Ill.

PLASTICS—Molded
Bakelite Corp., 247 Park Ave., N. Y. C.

PLASTICS—Synthetic
Bakelite Corp., 247 Park Ave., N. Y. C.

PLATER'S CLEANING COMPOUND
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PLATES—Floor or Cellar Door
Alan Wood Steel Co., Conshohocken, Pa.
American Pressed Steel Co., Phila., Pa.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
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Inland Steel Co., Chicago.

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Inland Steel Co., Chicago.
Jones & Laughlin Steel Corp., Pittsburgh.
Ryerson, Joseph T., & Son, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Weirton (W. Va.) Steel Co.
Worth Steel Co., Claymont, Del.
Youngstown (Ohio) Sheet & Tube Co., The.

PLATFORMS—Skid
Lewis-Shepard Co., 122 Walnut St., Watertown Station, Boston.

PLUGS—Core Hole
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.

POLISHING & BUFFING MACHINES—Automatic
Packer Machine Co., The, Meriden, Conn.

POLISHING MACHINES
Continental Machine Specialties, Inc., Minneapolis, Minn.
Packer Machine Co., The, Meriden, Conn.

POLISHING MACHINES—Bar
Medart Co., The, St. Louis, Mo.

POLISHING MACHINES—Belt
Production Machine Co., Greenfield, Mass.

POTS—Lead, Cyanide or Carbon
Electro Alloys Co., Elyria, Ohio.

POWER UNITS—Rotary
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New Departure Div., General Motors Corp., Bristol, Conn.

POWER UNITS—Straight Line
Cushman Chuck Co., Hartford, Conn.

PRECIPITATORS—Electrostatic Dust
Pangborn Corporation, Hagerstown, Md.

PRESS FEEDS—Automatic
Littell, F. J., Mch. Co., Chicago.

PRESSED METAL PARTS
Champion Sheet Metal Co., Inc., cor. Squires & Duane Sts., Cortland, N. Y.
Crosby Co., The, Buffalo, N. Y.
Stanley Works, The, New Britain, Conn.; Bridgeport, Conn.
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Whitehead Stamping Co., 1669 W. Lafayette Blvd., Detroit, Mich.

PRESSED STEEL PARTS
Crosby Co., The, Buffalo, N. Y.
Lansing (Mich.) Stamping Co., So. Penn Ave.
Parish Pressed Steel Co., Reading, Pa.
Toledo (Ohio) Stamping & Mfg. Co.
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Truscon Steel Co., Pressed Steel Div., Cleveland.

PRESSES—Automatic
Henry & Wright Mfg. Co., The, Hartford, Conn.
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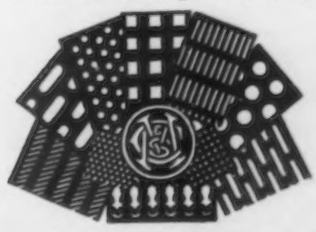

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Zeh & Hahnemann Co., Newark, N. J.

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Niagara Machine & Tool Works, Buffalo, N. Y.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

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Niagara Mch. & Tool Wks., Buffalo, N. Y.
U. S. Tool Co., Inc., Ampere, N. J.

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Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Birdsboro (Pa.) Steel Foundry & Machine Co.
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Elmes, Chas. F., Engng. Wks., Chicago.
Farquhar, A. B., Co., Ltd., York, Pa.
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Hannifin Mfg. Co., Chicago.
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Lake Erie Engineering Corp., 68 Kenmore Sta., Buffalo, N. Y.
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Wood, R. D., & Co., Philadelphia.

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Niagara Mch. & Tool Wks., Buffalo, N. Y.

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Falls Clutch & Mchry. Co., The, Cuyahoga Falls, Ohio.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd., Chicago.

PULLEYS—Magnetic
Cutler-Hammer, Inc., Milwaukee.

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Vacuum Cup Metal Pulley Co., Inc., Detroit, Mich.

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American Pulverizer Co., 1439 Macklind Ave., St. Louis, Mo.
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PUMPS—Acid Resisting
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Haveg Corporation, Newark, Delaware.

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Fairbanks, Morse & Co., Chicago.
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Pennsylvania Pump & Compressor Co., Easton, Pa.
Ruthman Machinery Co., Cincinnati.
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Pennsylvania Pump & Compressor Co., Easton, Pa.
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PUNCHES & DIES
Cleveland Steel Tool Co., The, 660 E. 82d St., Cleveland, Ohio.

PUNCHING AND SHEARING MACHINES
Beatty Mch. & Mfg. Co., 936—150th St., Hammond, Ind.
Bertsch & Co., Cambridge City, Ind.
Cincinnati (Ohio) Shaper Co., The.
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Thomas Mach. Mfg. Co., Pittsburgh.

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Leeds & Northrup Co., Philadelphia.

RAILS
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Foster, L. B., Co., Inc., Pittsburgh.
Frank, M. K., 480 Lexington Ave., N. Y. C.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.

RAILS—Relaying
Hyman-Michaels Co., Chicago.
Iron & Steel Products, Inc., Chicago.
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Fairbanks, Morse & Co., Chicago.
Iron & Steel Products, Inc., Chicago.

REAMERS
Cleveland (Ohio) Twist Drill Co., The.
Greenfield (Mass.) Tap & Die Corp.
Morse Twist Drill & Mch. Co., New Bedford, Mass.
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REAMING MACHINES
Blanchard Machine Co., The, Cambridge, Mass.

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REELS—For Coil Stock
Littell, F. J., Mch. Co., Chicago.

REFRACTORIES
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Cleveland (Ohio) Quarries Co., The.
Illinois Clay Products Co., Joliet, Ill.
West Virginia Fire Clay Mfg. Co., Pittsburgh.

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Pittsburgh (Pa.) Steel Co.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

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Midvale Co., The, Nicetown, Phila., Pa.
Standard Steel Wks. Co., Burnham, Pa.

RINGS—Welded
American Welding & Mfg. Co., Warren, O.

RIVET MAKING MACHINERY
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Waterbury (Conn.) Farrel Foundry & Machine Co., The.

RIVET SETS
Cleveland Steel Tool Co., The, 660 E. 82d St., Cleveland, Ohio.

RIVETING MACHINES
Hanna Engineering Works, 1761 Elston Ave., Chicago.
Hannifin Mfg. Co., Chicago.
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Tomkins-Johnson Co., The, Jackson, Mich.

RIVETS
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Hassall, John, Inc., Clay & Oakland Sts., Bklyn., N. Y.
Progressive Mfg. Co., Torrington, Conn.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.

RODS—Aluminum
Aluminum Co. of America, Pittsburgh.

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American Brass Co., The, Waterbury, Conn.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.

RODS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

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American Brass Co., The, Waterbury, Conn.
Seymour (Conn.) Mfg. Co.

RODS—Phosphor Bronze
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Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.
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Rustless Iron & Steel Corp., Baltimore, Md.

RODS—Welding
Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
American Brass Co., The, Waterbury, Conn.
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
Electric Arc Cutting & Welding Co., The, Newark, N. J.
Harnischfeger Corp., 4401 W. National Ave., Milwaukee.
Lincoln Electric Co., The, Cleveland.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.
Pittsburgh (Pa.) Steel Co.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.
Una Welding, Inc., Cleveland, Ohio.
Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York City.

RODS—Wire
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
Bethlehem (Pa.) Steel Co.
Jones & Laughlin Steel Corp., Pittsburgh.
Pittsburgh (Pa.) Steel Co.
Wickwire Brothers, Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.
Youngstown (Ohio) Sheet & Tube Co., The.

ROLLING MACHINERY—Cold Rolling
Cold Metal Process Co., The, Youngstown, Ohio.
Lewis Foundry & Mch. Co., Pittsburgh.
United Engineering & Fdry. Co., Pitgh.

ROLLING MACHINERY—Sheet Metal
Lewis Foundry & Mch. Co., Pittsburgh.

ROLLING MILL MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Cold Metal Process Co., The, Youngstown, Ohio.
Farrel-Birmingham Co., Inc., Ansonia, Ct.
Hyde Park (Pa.) Fdry. & Mch. Co.
Lewis Foundry & Mch. Co., Pittsburgh.
Mesta Mch. Co., Pittsburgh.
Morgan Construction Co., Worcester, Mass.
Morgan Engineering Co., The, Alliance, O.
National Roll & Fdry. Co., Avonmore, Pa.
Standard Machinery Co., Providence, R. I.
United Engineering & Fdry. Co., Pitgh.
Waterbury (Ct.) Farrel Fdry. & Mch. Co. The.

ROLLING MILLS—Copper Rod & Sheet
Torrington (Conn.) Mfg. Co., The.

ROLLS—Alloy Steel
Pittsburgh (Pa.) Rolls Corp.

ROLLS—Bending and Straightening
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Bertsch & Co., Cambridge City, Ind.
Lake Erie Engineering Corp., 68 Kenmore Sts., Buffalo, N. Y.
Niagara Machine & Tool Works, Buffalo, N. Y.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

ROLLS—Rubber Covered
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.

ROLLS—Sand Chilled Iron and Steel
Aetna-Standard Engineering Co., The Youngstown, Ohio.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Hyde Park (Pa.) Fdry. & Mch. Co.
Lewis Foundry & Mch. Co., Pittsburgh.
Mackintosh-Hemphill Co., Pittsburgh.
Mesta Mch. Co., Pittsburgh.
National Roll & Fdry. Co., Avonmore, Pa.
Pittsburgh (Pa.) Rolls Corp.
United Engineering & Fdry. Co., Pitgh.

ROLLS—Special Hardened
Midvale Co., The Nicetown, Phila., Pa.

ROOFING—Special Copper Bearing Steel
Superior Sheet Steel Co., Canton, Ohio.

ROOFING AND SIDING—Corrugated and Plain
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Johns-Manville Corp., 22 East 40th St., New York City.
Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co., The.

ROOFING AND SIDING—Iron and Steel
Inland Steel Co., Chicago.

ROOFING & SIDING—(Zinc)—Corrugated & Plain
New Jersey Zinc Co., The, 160 Front St., N. Y. C.

RUBBER LININGS
Goodrich, B. F., Co., The, Akron, Ohio.
Goodyear Tire & Rubber Co., Akron, Ohio.

RUBBER MOLDED PARTS
Goodyear Tire & Rubber Co., Akron, Ohio.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., The, 2 Townsend St., Passaic, N. J.
Richardson Co., The, Melrose Park, Ill.

RUST PREVENTIVES
American Chemical Paint Co., Ambler, Pa.
American Lanolin Corp., Lawrence, Mass.
Midland Paint & Varnish Co., The, Cleveland.
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.

RUST PROOFING COMPOUNDS
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.

RUST PROOFING PROCESS
American Chemical Paint Co., Ambler, Pa.
Parker Rust-Proof Co., 2186 Milwaukee Ave., Detroit.
Udylite Co., The, Detroit.

SAND BLAST EQUIPMENT AND MACHINES
American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.
Panghorn Corporation, Hagerstown, Md.

SAND BLAST STEEL SHOT
American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.
Pittsburgh (Pa.) Crushed Steel Co.

SAND HANDLING EQUIPMENT
Bartlett, C. O.-Snow Co., The, Cleveland.

SAWING MACHINES—Metal
Espen-Lucas Mch. Works, Phila.
Peerless Mch. Co., Racine, Wis.
Tannewitz Works, The, Grand Rapids, Mich.

SAWING MACHINES—Metal-Band
Continental Machine Specialties, Inc., Minneapolis, Minn.
Tannewitz Works, The, Grand Rapids, Mich.

SAWS—Band and Hack for Metal
Armstrong-Blum Mfg. Co., Chicago.
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.
Tannewitz Works, The, Grand Rapids, Mich.
Wells Mfg. Corp., Three Rivers, Mich.

SAWS—Circular, Rip & Cutoff
Atkins, E. C., & Co., Indianapolis.

SAWS—Friction
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.

SAWS—Hack Saw Blades
Atkins, E. C., & Co., Indianapolis.
Peerless Mch. Co., Racine, Wis.
Starrett, L. S., Co., Athol, Mass.

SAWS—Hot Metal
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.

SAWS—Inserted Tooth, Cold
Disston, Henry, & Sons, Inc., Philadelphia.
Tabor Mfg. Co., Philadelphia.

SAWS—Milling
Atkins, E. C., & Co., Indianapolis.
Disston, Henry, & Sons, Inc., Philadelphia.

SAWS—Portable Electric
Black & Decker Mfg. Co., The, Towson, Md.

SCALES
Exact Weight Scale Co., Columbus, Ohio.
Fairbanks, Morse & Co., Chicago.
Streeter-Amet Co., Chicago.

SCREENS—Perforated Metal
Chicago Perforating Co., 2440 W. 24th Place, Chicago, Ill.
Diamond Mfg. Co., Wyoming, Pa.
Erdle Perforating Co., Rochester, N. Y.
Harrington & King Perforating Co., Chicago.
Hendrick Mfg. Co., Carbondale, Pa.
Mundt, Chas., & Sons, 59 Fairmount Ave., Jersey City, N. J.

SCREENS—Woven Wire
Wickwire Brothers, Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

SCREW MACHINE PRODUCTS
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.
Blake & Johnson Co., The, Waterville, Ct.
Commonwealth Brass Corp., Detroit.
Eastern Mch. Screw Corp., New Haven.
Houde Engineering Corp., Buffalo, N. Y.
National Acme Co., The, Cleveland.
Olson Mfg. Co., Worcester, Mass.
Ottemiller, Wm. H., Co., Inc., York, Pa.
Peck Spring Co., The, Plainville, Conn.
Progressive Mfg. Co., Torrington, Conn.
Screw Mch. Products Corp., Prov., R. I.

SCREW MACHINERY—Automatic
Brown & Sharpe Mfg. Co., Providence, R. I.
Cone Automatic Mach. Co., Inc., Windsor, Vt.
National Acme Co., The, Cleveland.

SCREW MACHINERY—Hand
Warner & Swasey Co., The, Cleveland.

SCREW MACHINERY—Multiple Spindle
Acme Machine Tool Co., Cincinnati.
Cone Automatic Mach. Co., Inc., Windsor, Vt.
National Acme Co., The, Cleveland.

SCREW PLATES
Greenfield (Mass.) Tap & Die Corp.

SCREW STOCK
Bliss & Laughlin, Inc., Harvey, Ill.
Union Drawn Steel Co., Massillon, Ohio.

SCREWS—Cap
Cleveland (Ohio) Cap Screw Co., The.
Lamson & Sessions Co., The, Cleveland.
National Acme Co., The, Cleveland
Ottemiller, Wm. H., Co., Inc., York, Pa.

SCREWS—Coach or Lag
Lamson & Sessions Co., The, Cleveland.

SCREWS—Machine
Blake & Johnson Co., The, Waterville, Ct.
Lamson & Sessions Co., The, Cleveland.
Progressive Mfg. Co., The, Torrington, Ct.

SCREWS—Safety Set
Progressive Mfg. Co., The, Torrington, Ct.
Standard Pressed Steel Co., Jenkintown, Pa.

SCREWS—Set
Cleveland (Ohio) Cap Screw Co., The.
National Acme Co., The, Cleveland.
Ottemiller, Wm. H., Co., Inc., York, Pa.

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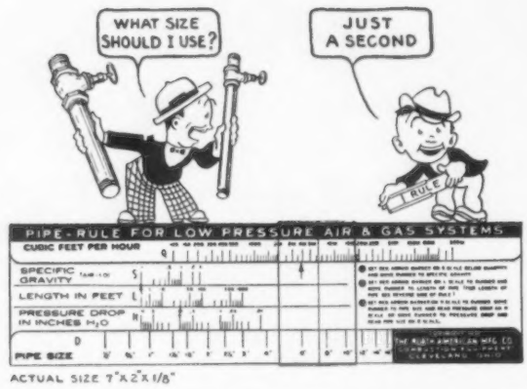
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Products Index

SCREWS, Socket, Head, Cap
Standard Pressed Steel Co., Jenkintown, Pa.

SCREWS—Thumb
Parker-Kalon Corp., 196 Varick St., N. Y.

SCRUBBING MACHINES—Sheet
Wean Engineering Co., Inc., The, Warren, Ohio.

SCYTHE STONES AND WHETSTONES
Carborundum Co., The, Niagara Falls, N.Y.

SECOND - HAND MACHINERY—(See Clearing House Section)

SEPARATORS—Magnetic
Dings Magnetic Separator Co., Milkauwee.
Ohio Electric Mfg. Co., The, 5908 Maurice Ave., Cleveland.
Stearns Magnetic Mfg. Co., 635 So. 28th St., Milwaukee.

SHAFTING—Cold Drawn
Union Drawn Steel Co., Massillon, Ohio.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAFTING—Forged
Bay City Forge Co., Erie, Pa.

SHAFTING—Steel
Bliss & Laughlin, Inc., Harvey, Ill.
Union Drawn Steel Co., Massillon, Ohio.

SHAFTING—Turned and Ground
Bliss & Laughlin, Inc., Harvey, Ill.
Ryerson, Jos. T., & Son, Inc., Chicago.
Union Drawn Steel Co., Massillon, Ohio.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAPERS
Cincinnati (Ohio) Shaper Co., The.

SHAPERS—Vertical
Pratt & Whitney Div. Niles-Bement-Pond Co., Hartford, Conn.

SHAPES—Cold Drawn
Bliss & Laughlin, Inc., Harvey, Ill.
Union Drawn Steel Co., Massillon, Ohio.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

SHAPES—Wire
American Spring & Mfg. Corp., Holly, Mich.
Cuyahoga Spring Co., The, Cleveland.
Eastern Tool & Mfg. Co., Bloomfield, N. J.
Grammes, L. F., & Sons, Inc., Allentown, Pa.
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.
Roebling's, John A. Sons Co., Trenton, N. J.

SHEAR BLADES & KNIVES
American Shear Knife Co., Homestead, Pa.
Canton Fdry. & Mch. Co., Cleveland.

SHEARING MACHINES—Alligator
Canton Fdry. & Mch. Co., Cleveland.

SHEARING MACHINES—Angle, Hand and Power
Federal Bearings Co., Inc., The, Poughkeepsie, N. Y.
G. D. S. Machinery & Supply Co., Inc., 101 Walker St., N. Y. C.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.

SHEARING MACHINES—Bar
G. D. S. Machinery & Supply Co., Inc., 101 Walker St., N. Y. C.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
United Engineering & Fdry. Co., Pitgh.

SHEARING MACHINES — Beam and Channel
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
United Engineering & Fdry. Co., Pitgh.

SHEARING MACHINES—Billet
Morgan Engineering Co., The, Alliance, O.
Pels, Henry, & Co., Inc., 90 West St., N. Y. C.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
United Engineering & Fdry. Co., Pitgh.

SHEARING MACHINES — Continuous Sheet & Pack
Aetna-Standard Engineering Co., The, Youngstown, Ohio.

SHEARING MACHINES—Plate
Bertsch & Co., Cambridge City, Ind.
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Mesta Mch. Co., Pittsburgh.
Morgan Engineering Co., The, Alliance, O.
Niagara Machine & Tool Works, Buffalo, N. Y.
Pels, Henry, & Co., Inc., 90 West St., N. Y. C.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
United Engineering & Fdry. Co., Pitgh.

SHEARING MACHINES — Sheet and Plate
Beatty Mch. & Mfg. Co., 936—150th St., Hammond, Ind.
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
Niagara Mach. & Tool Wks., Buffalo, N. Y.

SHEARING MACHINES—Squaring
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Co., Chicago.
Niagara Mach. & Tool Wks., Buffalo, N. Y.

SHEARS—Hand for Sheet Metal
Bremil Mfg. Co., Erie, Pa.

SHEET BARS
Jones & Laughlin Steel Corp., Pittsburgh.

SHEET METAL MACHINERY
Cincinnati (Ohio) Shaper Co., The.
Dreis & Krump Mfg. Co., Chicago.
New Albany (Ind.) Mch. Mfg. Co.
Niagara Mach. & Tool Wks., Buffalo, N. Y.
Peck, Stow & Wilcox Co., The, Southington, Conn.
V & O Press Co., Hudson, N. Y.
Waterbury (Conn.) Farrel Foundry & Machine Co., The.

SHEETS—Aluminum
Aluminum Co. of America, Pittsburgh.

SHEETS—Auto Body
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Inland Steel Co., Chicago.
Republic Steel Corp., Cleveland, Ohio.
Youngstown (Ohio) Sheet & Tube Co., The.

SHEETS—Black
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Granite City (Ill.) Steel Co.
Ingersoll Steel & Disc Co., Chicago.
Inland Steel Co., Chicago.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos., T., & Son, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Weirton (W. Va.) Steel Co.

SHEETS—Blue Annealed
Alan Wood Steel Co., Conshohocken, Pa.
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Great Lakes Steel Corp., Detroit.
Ryerson, Jos. T., & Son, Inc., Chicago.
Weirton (W. Va.) Steel Co.
Worth Steel Co., Claymont, Del.

SHEETS—Brass, Bronze, Copper, Nickel, Silver or Phosphor Bronze
American Brass Co., The, Waterbury, Conn.
Phosphor Bronze Smelting Co., The, Phila.
Revere Copper & Brass, Inc., 230 Park Ave., N. Y. C.
Seymour (Conn.) Mfg. Co.

SHEETS—Chrome
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Chrome Nickel
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Cold Rolled
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Granite City (Ill.) Steel Co.
Great Lakes Steel Corp., Detroit.
Inland Steel Co., Chicago.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos., T., & Son, Inc., Chicago.
Weirton (W. Va.) Steel Co.

SHEETS—Copper Alloy
American Brass Co., The Waterbury, Conn.

SHEETS—Copper Steel
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Inland Steel Co., Chicago.

SHEETS—Electrical
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Republic Steel Corp., Cleveland, Ohio.

SHEETS—Enameling
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Great Lakes Steel Corp., Detroit.
Inland Steel Co., Chicago.

SHEETS—For Drawing and Stamping
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Superior Sheet Steel Co., Canton, Ohio.
Worth Steel Co., Claymont, Del.

SHEETS—Full Finished
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Republic Steel Corp., Cleveland, Ohio.
Youngstown (Ohio) Sheet & Tube Co., The.

SHEETS—Galvanized, Flat and Corrugated
American Rolling Mill Co., Middletown, O.
Bethlehem (Pa.) Steel Co.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Columbia Steel Co. (U. S. Steel Corp. Subsidiary), San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Granite City (Ill.) Steel Co.
Inland Steel Co., Chicago.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.

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Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Weirton (W. Va.) Steel Co.
Youngstown (Ohio) Sheet & Tube Co., The.

SHEETS—Lead
National Lead Co., 111 Bdway., N. Y. C.

SHEETS—Long Terne
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Weirton (W. Va.) Steel Co.

SHEETS—Magnesium Alloys
Dow Chemical Co., The, 921 Jefferson Ave., Midland, Mich.

SHEETS—Metal Furniture
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Republic Steel Corp., Cleveland, Ohio.

SHEETS—Pickled
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Tin Mill Black
American Rolling Mill Co., Middletown, O.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SHEETS—Zinc
New Jersey Zinc Co., The, 160 Front St.,

SHELVING—Steel
Frick-Gallagher Mfg. Co., The, Wellston, Ohio.

SHOVELS—Mounted—See Cranes

SHUTTERS—Steel & Wood Bi-Folding
Kinnear Mfg. Co., Columbus, Ohio.

SILICO—MANGANESE
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

SILICON METAL & ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

SLINGS—Wire Rope
Murray Safety Sling Co., Inc., Pitts., Pa.
Roebling's, John A., Sons Co., Trenton, N. J.

SLOTTING MACHINES
Nazel Engineering & Machine Works, Philadelphia.

SOLVENTS—Oil & Grease
Detroit Rex Products Co., Detroit, Mich.

SPACING TABLES—Punching & Shearing
Thomas Mach. Mfg. Co., Pittsburgh.

SPECIAL MACHINERY
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Bullard Co., The, Bridgeport, Conn.
Eastern Tool & Mfg. Co., Bloomfield, N. J.
Farquhar, A. B., Co., Ltd., York, Pa.
Gifford-Wood Co., Hudson, N. Y.
Houde Engineering Corp., Buffalo, N. Y.
Manville, E. J., Mch. Co., Waterbury, Ct.
Morgan Engineering Co., The, Alliance, O.
Taft-Peirce Mfg. Co., The, Woonsocket, R. I.
Wood, R. D., & Co., Philadelphia.

SPECIALTIES—Rubber Covered & Lined
Goodrich, B. F., Co., The, Akron, Ohio.

SPEED REDUCERS
Boston Gear Wks, Inc., North Quincy, Mass.
Cleveland (Ohio) Worm & Gear Co.
Horsburgh & Scott Co., 5112 Hamilton Ave., Cleveland.
James, D. O., Mfg. Co., Chicago.
Jones, W. A., Fdry. & Mch. Co., 4401 Roosevelt Rd. Chicago.
Link-Belt Co., Chicago.
Philadelphia (Pa.) Gear Works.
Poole Foundry & Mch. Co., Baltimore, Md.

SPIEGELEISEN
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

SPIKES—Screw
Oliver Iron & Steel Corp., Pittsburgh.

SPIKES—Track
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Weirton (W. Va.) Steel Co.

SPINDLES—Grinding
Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit.

SPINDLES—Hollow Bored
American Hollow Boring Co., 1912 Raspberry St., Erie, Pa.

SPLICE BARS
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.

SPRAY FINISHING EQUIPMENT
DeVilbiss Co., The, Toledo, Ohio.

SPRAYERS—Metal
Metals Coating Co. of America, Phila., Pa.

SPRAYERS—Paint
DeVilbiss Co., The, Toledo, Ohio.

SPRING MAKING MACHINERY
Baird Mch. Co., The, Bridgeport, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington (Conn.) Mfg. Co., The.

SPRINGS—Car
Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.

SPRINGS—Extension, Compression, Torsion or Flat
Amer. Spring & Mfg. Corp., Holly, Mich.
American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.
Cook Plant of Barnes-Gibson-Raymond, Div. of Associated Spring Corp., Ann Arbor, Mich.
Cuyahoga Spring Co., The, Cleveland.
Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.
Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.
Peck Spring Co., The, Plainville, Conn.
Raymond Mfg. Co., Div. of Associated Spring Corp., Corry, Pa.
U. S. Steel Wire Spring Co., Cleveland, O.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

SPROCKETS
Baldwin-Duckworth Chain Corp., Springfield, Mass.
Boston Gear Wks., Inc., North Quincy, Mass.
Diamond Chain & Mfg. Co., Indianapolis, Ind.
Morse Chain Co., Ithaca, New York.
Whitney Chain & Mfg. Co., Hartford, Ct.

STAMPINGS OR DRAWINGS—Metal
Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.
Barnes, Wallace Co., The, Div. of Associated Spring Corp., Bristol, Conn.
Central Iron & Steel Co., Harrisburg, Pa.
Champion Sheet Metal Co., Inc., cor. Squires & Duane Sts., Cortland, N. Y.
Cook Plant of Barnes-Gibson-Raymond, Div. of Associated Spring Corp., Ann Arbor, Mich.
Crosby Co., The, Buffalo, N. Y.
Dayton Rogers Mfg. Co., Minneapolis, Minn.
Dunbar Bros. Co., Div. of Associated Spring Corp., Bristol, Conn.
E S M C O Auto Products Corp., Bush Terminal Bldg. 27, Bklyn., N. Y.
Eastern Tool & Stpg. Co., Inc., Saugus, Mass.
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.
Grammes, L. F., & Sons, Inc., Allentown, Pa.
Hubbard, M. D., Spring Co., 750 Central Ave., Pontiac, Mich.
Lansing (Mich.) Stamping Co., So. Penn. Ave.
Lee Spring Co., Inc., 30 Main St., Brooklyn, N. Y.
Miller & Van Winkle, Inc., 18 Bridge St., Brooklyn, N. Y.
New Monarch Machine & Stamping Co., Des Moines, Iowa.
Parish Pressed Steel Co., Reading, Pa.
Raymond Mfg. Co., Div. of Associated Spring Corp., Corry, Pa.
Sessions, J. H., & Son, Bristol, Conn.
Special Hardware Co., Medford, N. Y.
Toledo (Ohio) Stamping & Mfg. Co.
Torrington (Conn.) Company
Transue & Williams Steel Forging Corp., Alliance, Ohio.
Truseon Steel Co., Pressed Steel Div., Cleveland.
Wagner Specialty Co., Burlington, Wis.
Whitehead Stamping Co., 1669 W. Lafayette Blvd., Detroit, Mich.
Worcester (Mass.) Stamped Metal Co.

STAMPS—Steel Alphabets and Figures
Cunningham, M. E., Co., Pittsburgh.
Noble & Westbrook Mfg. Co., The, East Hartfrod, Ct.

STAPLES—Wire
Wickwire Brothers, Cortland, N. Y.

STEEL—Acid Resisting
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.

STEEL—Alloy
Alan Wood Steel Co., Conshohocken, Pa.
American Steel Export Co., Inc., 347 Madison Ave., N. Y. C.
Bethlehem (Pa.) Steel Company.
Bissett Steel Co., The, Cleveland.
Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Harrisburg (Pa.) Steel Corp.
Ingersoll Steel & Disc Co., Chicago.
Jessop Steel Co., Washington, Pa.
Latrobe (Pa.) Electric Steel Co.
Ludlum Steel Co., Watervliet, N. Y.
Republic Steel Corp., Cleveland, Ohio.
Ryerson, Jos. T., & Son, Inc., Chicago.
Tennessee Coal, Iron & Railroad Co. (U. S. Steel Corp. Subsidiary), Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Vanadium-Alloys Steel Co., Latrobe, Pa.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.

STEEL—Alloy, Cold Drawn
Bliss & Laughlin, Inc., Harvey, Ill.
Union Drawn Steel Co., Massillon, Ohio.
Wheelock, Lovejoy & Co., Inc., Cambridge, Mass.
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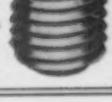

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Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
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Ingersoll Steel & Disc Co., Chicago.
Latrobe (Pa.) Electric Steel Co.

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Latrobe (Pa.) Electric Steel Co.

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Latrobe (Pa.) Electric Steel Co.

STEEL—Chrome Manganese
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STEEL—Chrome Nickel
Harrisburg (Pa.) Steel Corp.
Latrobe (Pa.) Electric Steel Co.

STEEL—Chrome Nickel Silver
Ingersoll Steel & Disc Co., Chicago.

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Latrobe (Pa.) Electric Steel Co.

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Ryerson, Joseph T., & Son, Inc., Chicago.
Union Drawn Steel Co., Massillon, Ohio.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

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American Steel & Wire Co. (U. S. Steel Corp. Subsidiary), Chicago.
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STEEL—Cold Rolled Strips, Electro Tin Coated
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Vanadium-Alloys Steel Co., Latrobe, Pa.

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Disston, Henry, & Sons, Inc., Philadelphia.
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Milne, A., & Co., 745 Washington St., N. Y. C.

STEEL—Drill
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Ludlum Steel Co., Watervliet, N. Y.
Milne, A., & Co., 745 Washington St., N. Y. C.

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Inland Steel Co., Chicago.
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Ludlum Steel Co., Watervliet, N. Y.
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Wyckoff Drawn Steel Co., Pittsburgh, Pa.

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Republic Steel Corp., Cleveland, Ohio.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

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Barnes-Gibson-Raymond, Detroit Plant, Div. of Associated Spring Corp.
Barnes, Wallace, Co., The, Div. of Associated Spring Corp., Bristol, Conn.
Gibson, Wm. D., Co., Div. of Associated Spring Corp., Chicago.
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Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.

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Carnegie-Illinois Steel Corp. (U. S. Steel Corp. Subsidiary), Pittsburgh & Chicago.
Disston, Henry, & Sons, Inc., Philadelphia.
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Republic Steel Corp., Cleveland, Ohio.
Rustless Iron & Steel Corp., Baltimore, Md.
Ryerson, Jos. T., & Sons, Inc., Chicago.
Scully Steel Products Co. (U. S. Steel Corp. Subsidiary), Chicago.
Superior Steel Corp., Grant Bldg., Pittsburgh.
Union Drawn Steel Co., Massillon, Ohio.
Wetherell Bros. Co., Cambridge, 39, Mass.

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Ingersoll Steel & Disc Co., Chicago.

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Ingersoll Steel & Disc Co., Chicago.
Jessop Steel Co., Washington, Pa.
Jessop, Wm., & Sons, Inc., 121 Varick St., N. Y. C.
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Ohio Seamless Tube Co., Shelby, Ohio.
Pittsburgh (Pa.) Steel Co.
Ryerson, Jos. T., & Son, Inc., Chicago.
Steel & Tubes, Inc., Cleveland.
Timken Roller Bearing Co., The, Canton, O.
Timken Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.
Youngstown (Ohio) Sheet & Tube Co., The.

TUBING—Square and Rectanguar
Steel & Tubes, Inc., Cleveland.

TUBING—Stainless Steel
Cleveland (Ohio) Tool & Supply Co., The.
Steel & Tubes, Inc., Cleveland.

TUBING—Tinned Brass or Copper
Bundy Tubing Co., Detroit, Mich.

TUBING—Tinned-Steel
Bundy Tubing Co., Detroit, Mich.

TUBING—Tool Steel
Bissett Steel Co., The, Cleveland.

TUBING—Welded Steel
Bundy Tubing Co., Detroit, Mich.
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Ohio Seamless Tube Co., Shelby, Ohio.
Steel & Tubes, Inc., Cleveland.
Youngstown (Ohio) Sheet & Tube Co., The.

TUBULAR PRODUCTS
National Tube Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.
Steel & Tubes, Inc., Cleveland.

TUMBLING BARRELS—See Barrels—Tumbling

TUNGSTEN—Metals & Alloys
Electro Metallurgical Sales Corp., 30 E. 42nd St., N. Y. C.

TUNGSTEN CARBIDE
Carboloy Co., Inc., 2985 E. Jefferson Ave., Detroit.

TURBINE-GENERATORS—Steam
General Electric Co., Schenectady, N. Y.
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

TURBO-COMPRESSORS
Spencer Turbine Co., Hartford, Conn.

TURNTABLES
American Bridge Co. (U. S. Steel Corp. Subsidiary), Pittsburgh.

TURNTABLES—Industrial
Canton Fdry. & Mch. Co., Cleveland.

TWIST DRILLS
Cleveland (Ohio) Twist Drill Co., The.
Greenfield (Mass.) Tap & Die Corp.
Morse Twist Drill & Mch. Co., New Bedford, Mass.

TYPE—Steel
Noble & Westbrook Mfg. Co., The, East Hartford, Ct.

UNIONS
Crane Co., Chicago.

UNIT HEATERS—Electric
American Foundry Equipment Co., The, 401 Byrkit St., Mishawaka, Ind.

VALVES—Acid Resisting
Dietzel Lead Burning Co., Pittsburgh
Duriron Co., Inc., The, 438 N. Findlay St., Dayton, Ohio.
National Lead Co., 111 Bdway., N. Y. C.

VALVES—Air Blast for Presses
Littell, F. J., Mch. Co., Chicago.

VALVES—Air & Hydraulic Control
Brown Instrument Co., The, Philadelphia, Pa.
Galland-Henning Mfg. Co., Milwaukee.
Hanna Engineering Works, 1761 Elston Ave., Chicago.
Hannifin Mfg. Co., Chicago.
Nicholson, W. H., & Co., 165 Oregon St., Wilkes-Barre, Pa.
Tomkins-Johnson Co., The, Jackson, Mich.
Westinghouse Air Brake Co., Industrial Div., Pittsburgh.

VALVES—Gas, Water and Steam
Brown Instrument Co., The, Philadelphia, Pa.
Crane Co., Chicago.
Jarecki Mfg. Co., Erie, Pa.
North American Mfg. Co., The, Cleveland.
Wood, R. D., & Co., Philadelphia.

VALVES—Hydraulic
Baldwin-Southwark Corp., Southwark Div., Philadelphia.
Birdsboro (Pa.) Steel Foundry & Machine Co.
Crane Co., Chicago.
Galland-Henning Mfg. Co., Milwaukee.
Wood, R. D., & Co., Philadelphia.

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Cleveland (Ohio) Pneumatic Tool Co., The.

VALVES—Proportioning
Brown Instrument Co., The, Philadelphia, Pa.
North American Mfg. Co., The, Cleveland.

VALVES—Pump, Rubber
Garlock Packing Co., The, Palmyra, N. Y.

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Jarecki Mfg. Co., Erie, Pa.
Knu-Vise Products Co., Detroit, Mich.

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Sessions, J. H., & Son, Bristol, Conn.

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Chicago (Ill.) Rawhide Mfg. Co., The, 1306 Elston Ave.

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American Nut & Bolt Fastener Co., Pittsburgh.
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Butcher & Hart Mfg. Co., Toledo, Ohio.
Eaton Mfg. Co., Massillon, Ohio.
Hobbs Mfg. Co., Worcester, Mass.
Houde Engineering Corp., Buffalo, N. Y.
National Lock Washer Co., The, Newark, N. J., and Milwaukee, Wis.
Philadelphia Steel & Wire Corp., Germantown, Philadelphia, Pa.
Positive Lock Washer Co., The, Newark, N. J.
Spring Washer Industry, 616 Wrigley Bldg., Chicago, Ill.
Washburn Co., The, Worcester, Mass.

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American Nut & Bolt Fastener Co., Pittsburgh.
Beall Tool Co., East Alton, Ill.
Butcher & Hart Mfg. Co., Toledo, Ohio.
Eaton Mfg. Co., Massillon, Ohio.
Hobbs Mfg. Co., Worcester, Mass.
National Lock Washer Co., The, Newark, N. J., and Milwaukee, Wis.
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Westinghouse Elec. & Mfg. Co., East Pgh.

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Air Reduction Sales Co., 60 East 42nd St., N. Y. C.
Linde Air Products Company, The, 30 East 42nd St., N. Y. C.
Weldit Acetylene Co., Detroit.

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Federal Machine & Welder Co., Warren, Ohio.
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Thomson-Gibb Elec. Welding Co., Lynn, Mass.

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Wilson Welder & Metals Co., Inc., 60 E. 42nd St., New York City.

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Wickwire Bros., Cortland, N. Y.
Wickwire Spencer Steel Co., 41 East 42nd St., N. Y. C.

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PRESS. 72", No. 3G Bliss double crank
PRESS. Nos. 1½ B & 5A Bliss toggle
PRESS. 600 ton Cleveland coining
PRESS. Nos. PG4 & PG5 Ferracute
ROLL. No. 1A Ajax forging
ROLL. 48" McKay 19 roll leveling
SAW. 9" x 9" Peerless hack
SHAPER. 16" Cincinnati
SHAPER. 24" Potter & Johnston univ.
SLOTTER. 20" Betts, MD, PRT
TAPPERS. Nos. 1, 2, 2X & 2BG Garvin
THREADER. 1" & 2" Landis 2 spdl.
THREADER. 2" & 3" Acme
UPSETTER. 1", 1½", 4" & 5" Ajax
UPSETTER. 1½" Acme
WELDER. 45 & 65KW Federal butt
WELDER. 300 amp. Lincoln arc
WELDER. 18 KVA A.E.F. auto spot
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16" Gould & Eberhardt Shaper, cone drive.
24" Gould & Eberhardt Shaper, gear box AC drive.
26" Lynd-Farquhar Openside Shaper, MD.
18" x 8' Springfield GH Lathe, arr. for MD.
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No. 3 Thiel Filing & Sawing Machine.
4-spindle Allen Drill, power feed to each spindle, MD.

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1300 cu. ft. 22"x13"x16" Ingersoll-Rand Class 10B2
1573 cu. ft. 22"x13"x14" Sullivan Class WN3
2678 cu. ft. 28"x17½"x21" Ingersoll-Rand Class PRE2

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4"x4"x½" Kling Bros. With extended base for geared motor drive. Rolls 18" dia. x 10" face

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Logemann Double, All Steel. Size of Bales 5"x9"x13". Each Hopper is 42"x16"x13"

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10' Ryerson Belt Driven. Capacity ½" Plate. Top Roll 12", Bottom Rolls 9" diameter
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4" bar Toledo Floor Type, Motor Driven. QCG.
6" bar Niles Knee Type, Arranged for Motor Drive
7" bar Floor Type, Arranged for A.C. Motor Drive

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2½", 3", 3½", 5" Ajax Steel Frame
5" AJAX HEAVY DUTY NEW MODEL, TWIN GEAR, TOP SUSPENDED HEADER SLIDE, MOTOR BRACKET
2", 5" National Steel Frame

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343 KVA General Electric 2300 v. 3 ph. 60 cy. Generator direct connected to 400 H.P. Rathburn Vertical Oil Engine
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40" Hilles & Jones, Motor Driven. Capacity ¼"
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1½" Acme Four Spindle, Belt Driven. For tapping ½" to 1½" square or hexagon nuts.

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36"x36"x16' Cleveland, Belted Motor Drive. One Rail and One Side Head
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2000 ton Watson Stillman, 33" Diameter Ram, 36" Stroke, Strain Rods 11" dia. x 13½'

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450 ton Birdsboro 4-Column Flanging Press, 8'x12' Between Columns, 10' Daylight
500 ton Mesta 4-Column Vertical, 48"x48" Between Columns, 9' Daylight
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600 ton Niles-Bement-Pond, 48" Between Parallel Bars, Distance of ram 17". Motor Driven

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No. 3 Billings & Spencer, 6" Stroke, 30" Between Uprights

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8 "x 4½" Blake & Johnson Single Stand 2 High
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12 "x16 " Phila. Single Stand Two High
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15 "x38 " Waterbury Farrel Single Stand 2 High Rod Mill, Motor Driven. Capacity Round Bars 1⅝" down to ⅝"
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Hilles & Jones, Arranged for Motor Drive. Six Rolls 13¾" dia. 10'6" Between Housings. Capacity 1" plate

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Garrison Bar Shear Arranged for Motor Drive. Length of Blade 9 1/16". Capacity 5" Rounds

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Bliss, Belt Driven. Capacity ⅛"
Quickwork No. 6, M. D. Cap. up to ⅝" plate

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MILLS, Nos. 1½A, 2A & 2B Milwaukee & B. & S.
MILL, No. 3GH Hendey Universal, S.P.D.
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SHAPER PLANER, 24" Coulter Openside
SHEAR, 10' ¼" United Eng'g, M.D.
SLOTTER, 16" Betts, M.D., like new, latest type

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1¾" x 7". New 1930. M.D.

60" COLBURN VERT. BORING MILL
Power rapid traverse. S.P.D.

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Self Contained — Motor Drive

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Planer with 2 Heads, 7 x 18', suitable for planing stone.
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No. S-51 Ferracute Double Crank
No. 507 Bliss Single Crank tierod frame
25 ton Henry & Wright Dieing machines
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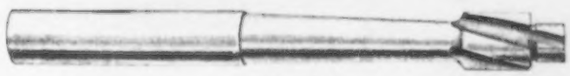

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No. 6—32	$ .45	$1.00
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1/4 x 3/8	.45	1.25
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Cameron No. 80-D Bodymakers.
Adriance No. 125 and No. 126 Double Seamers.
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Brake, 10' x 10 ga. Ohl, press type
Bulldozer, No. 9 Williams-White
Gang Slitter, Braddock, 36" x 11 gauge
Press, No. 58 Toledo S.S., grd., 35,000 lbs.
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Shear, No. 2120 Niagara, 10' x 14 ga.

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COMPLETE FORGING PLANT

2,500 lb. Chambersburg steam or air combination drop and forging hammer, double frame with 2 sets of flat dies.
Ingersoll-Rand XB compressor 14-9x12, 450 cu. ft. with Condor one piece belt.
75 HP. West. motor C2 220V. 3 ph. 60C. 700 RPM compensator and pulley.
360 cu. ft. receiver. OTHER EQUIPMENT.
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1 Keller No. E-202 Die Sinking Machine, M.D.
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1 Pels No. 16 Combination Iron Worker, motor driven.
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6 Shuster Wire straightening & cutting machines.
3 Baird No. 1, No. 2 & No. 3 four slide wire machines.
1 Cleveland Double Crank Power Press, 6" stroke.

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Automatic Can Machinery

Bodymakers—Flangers
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CAMDEN STEEL PLATE DOUBLE END
45" throat, cap. 1¼" thru 1"
CAMDEN HORIZ. & VERT.
30" throat and 11" throat
cap. 1" thru 1"
No. 2 HILLES & JONES DOUBLE END
30" throat, cap 1" thru 1"
No. 8 WHITNEY DOUBLE END
30" throat, cap. 1" thru 1"
CLEVELAND EF DOUBLE END
15" throat, cap. 1" thru 1"
No. 2 LONG & ALLSTATTER DOUBLE END
12" throat, cap. 1" thru 1"
No. 5 LONG & ALLSTATTER DOUBLE END
6" throat, cap. ⅜" thru ⅝"
No. 8 WHITNEY SINGLE END
48" throat, cap. 1" thru 1"
No. 2½ HILLES & JONES SINGLE END
48" throat, cap. 1" thru 1"
STYLE G CLEVELAND SINGLE END
48" throat, cap. 2" thru 1"
No. 6 BEATTY SINGLE END
36" throat, cap. 1" thru 1"
CLEVELAND STYLE C SINGLE END
36" throat, cap. ¾" thru ¾"
No. 15 WILLIAMS & WHITE
30" throat, cap. ⅞" thru ¾"
BA CLEVELAND SINGLE END
20" throat, cap. ½" thru ½"
ROCK RIVER SINGLE END
12½" throat, cap. ¾" thru ¾"
No. 7 KLING SINGLE END
12" throat, cap. 1¼" thru 1"
No. 10L ROCK RIVER SINGLE END
10" throat, cap. ½" thru ½"
G8 ROCK RIVER SINGLE END
8" throat, cap. ¾" thru ¾"
No. 5 LONG & ALLSTATTER SINGLE END
8" throat, cap. ⅝" thru ⅝"
No. 2 LONG & ALLSTATTER SINGLE END
8" throat, cap. 1" thru 1"

PUNCHING & COPING

CLEVELAND IW
30" throat, 30" gap
CLEVELAND W
16" throat, 26" gap
LONG & ALLSTATTER
24" throat, 50" gap

ANGLE SHEAR

KLING DOUBLE ANGLE SHEAR
Cap. 8" x 8" x 1"

MULTIPLE PUNCHES & SHEARS

No. 4 CLEVELAND MULTIPLE, 60" length
No. 1 LONG & ALLSTATTER
Cap. ¼" x 16'
No. 3 LONG & ALLSTATTER
Cap. 3/16" x 48"
No. 4 LONG & ALLSTATTER
Cap. 3/16" x 48"

SQUARING SHEARS

No. 416F TOLEDO cap. 5' x 16 gauge
No. 418A TOLEDO, cap. 30" x 18 gauge
No. 5 LONG & ALLSTATTER cap. 8' x 7 gauge
No. 416 1 TOLEDO, cap. 8' x 16 gauge
No. 736 NIAGARA, cap. 3/16" x 36"

HORIZONTAL PUNCHES

No. 2 LONG & ALLSTATTER
24" throat, cap. 1" thru 1"
No. 2 HILLES & JONES
12" throat, cap. 1" thru 1"
No. 4 LONG & ALLSTATTER
Cap. ¾" thru ¾"
SOUTHWARK
cap. 1" thru mild steel plate

MISCELLANEOUS

48" NEWTON ROTARY PLANER
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No. 260E-11 AMPLEX COMB. PUNCH & SHEAR
No. 4 RYERSON SCAP PUNCH & SHEAR
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EMBOSSING PRESSES, 400 and 600 Ton
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1—Ingersoll Steam Driven Compressor, Type XPV3, cap. 1260 cu. ft.

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MOTOR GEN. SETS	100 K.W. G.E. 230 V. 100 K.W. G.E. 115 V. 50 K.W. G.E. 230 V. 30 K.W. West. 230 V.
115 V. D.C. MOTORS	90 H.P. G.E. 900 RPM 50 H.P. G.E. 1750 RPM 40 H.P. G E. 400/600 RPM
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850	West.	2200	C.W.-Slipring	440
500	Al. Chal.	4000/2300	Slipring	500
450	West.	440/220	Synch.	257
450/360	West.	2200	C.W.-Slipring	875/700
400	G.E.	4150/2300	MT-Slipring	390
375	G.E.	2300	ATI-Synch.	600
350	CR. WH.	2300/440	Synch.	720
300	West.	440/220	C.W.-Slipring	1800
250	G.E.	4000/2300	M.T.-Slipring	257
250	CR. WH.	440/220	128G-Slipring	435
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2—50'x300' Steel Sheds.
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1—1-yd. 30t Koehring Gas Cat. Crane
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1—1000 KW G.E. con. Turbo-Gen. 3/60/2300.
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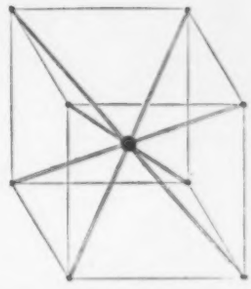

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